Computer News 80

P.O. BOX 680/CASPER, WYOMING 82602-0680 307-265-6483

MARCH 1993 VOLUME 6 NUMBER 3 $ 4.00

INDEX

NEW FILE CABINET DISKS Page 2

CLARIFICATION
by David P. Miller Page 3

DAVE'S MOUSE MENU
by David P. Miller Page 3

A VISIT WITH DAVID GOBEN
by David Goben Page 6

ART NOUVEAU ICONS
by Gary Shanafelt Page 10

FLOWxDBL4 & FLOWxDBL3
by Henry H. Herrdegen Page 11

ADDRESS LIST BASIC PROGRAM
by Robert Knowles Page 12

FOUR PART BASIC, Part One
by Robert Knowles Page 13

DOUBLE TALK PROGRAM
by Leonard Lorden Page 14

BIORHYTHM GRAPH FOR 3 & 4
by Henry H. Herrdegen Page 14

HOW COMPUTERS WORK
by Ken Strickler Page 16

OPEN FORUM Page 19

PROGRAM LISTINGS Page 20
TRS-80 SHOPPERS GUIDE
With CN80 Product Guide Page 27

EDITORIAL COMMENT

We really have some great new programs to introduce you to this month. Two new programs by David P. Miller author of the PostMaster program, one of which is surely to be of great value to those who have both Model 4 and MS/PC computers because it will format a MicroSoft disk on your Model 4, 4P or 4D and transfer files between the two. The other program by David P. Miller is his mouse menu program, that will keep your mouse busy but does not require a mouse to run. We have printed the full set of Dave's Mouse Menu in this issue because it contains the best explanation of what his program does. If you have trouble remembering all those DOS level commands and their parameters now you can write your own menu and use your mouse, arrow keys to "point and shoot" the command or just type a letter on your keyboard.

David Goben's Small C for LS-DOS is ready to ship. From what we are told this package for the Small C programming language, which David has reprogrammed to work on the Model 4, is much easier than Assembly Language programming. So if you are new to programming and just starting out this may be the programming language for you. At least you can depend on having an expert programmer assist you along the way, nothing is so hard as buying a "how to do it" book off the shelf and having no one to turn to to answer those parts that you don't grasp on the first reading. According to David "one reading of the Small C manual and you will already know a lot about Small C programming."

You also might want to order a copy of "Rookie Programming" by Ron Dippold which as an excellent section on C and

March
1993

Small C programming as well as a full explanation of the other programming languages. This book is written in simple english so that anyone can understand what programming and programming languages are all about. To quote the authors "Pascal has been described by many as a language that is great for teaching the basics of programming but terrible for actually programming." C and Small C "has all the added conveniences of a language like Pascal, but is easier for the computer to translate into something almost as fast and small as a similar assembly language program -- but C is more efficient."

This presents us with a good opportunity to tell you something more about the books listed in our Book Section of the CN80 Product Guide. Each of these books "How to get started with modems", Rookie Programming", Simple Computing Maintenance and Repair", "101 Computer Business Ideas" were selected because of their presentation of the subject matter in clear layman's terms rather than a lot of computereze technical talk where the author assumes that you already have had years of computer experience. "The Official Computer Widow's (and Widower's) Handbook" is offered because of it's hilarious presentation of the problems and solutions associated with "what does the wife or husband do while the other is engrossed for hours at a time on a computer." From sympathy to outrage, from games for one to crossword puzzles, you will find it covered in this book which has proved to be one of our best sellers.

These are books that you will not find in every book store. We have also been looking over a selection by the same publisher of some great MS/PC related books that we will soon be adding to our list for those of you who have both types of computers.

New additions to the Model 4 File Cabinet Public Domain Library include a disk of 100 business forms and stock letters that anyone will find useful. The business forms will print out on a dot matrix printer or laser with vertical lines and horizontal lines where appropriate. For example you can call one of these files which are stored in ASCII into your word processing program and modify it to fit your needs. Sure saves a lot of layout time drawing lines for order blanks or purchase order type forms.

To order ask for M4BUS36.

Other volumes added to the Model 4 File Cabinet Library include:

M4BUS35 a simple shareware program for keeping small accounts.

M4EDU35 and M4EDU36 a collection of programs from Trslinks. The Best of Trslinks.

M4GAM27 a collection of programs to create crossword puzzles. High Resolution board and Basic G required.

M4GAM28 a collection of games including Tetris compatible with the use of a mouse.

M4UTL62 has the following utility programs:

FLOATSUB/BAS	Basic Subset to create floating window for text or graphics by Leonard Lorden
FLOATDMO/BAS	Demo program for FLOATSUB/BAS
TOUCH/CCC	Source Code for Touch programs modifies date or time of disk by Ken Peck, modified by Art McAninch
TOUCH/DOC	Documentation for TOUCH programs
TOUCH1/CMD	For Model I using LDOS 5.1.x
TOUCH1/JCL	JCL to Patch original Touch Program
TOUCH5/CMD	For Model III using LDOS
TOUCH6/CMD	For Model 4 using LS-DOS 6.3

M4UTL63 has the following file sort and other utilites:

DSORT4/CMD	File Sort program
DSORTE4/CMD	Expanded file sort
DSORT/DOC	Documentation for DSORT4

MD4UTL64 has Model 4 LS-DOS 6.3.1
XLR8er Support Patches
by David Goben

M4UTL65 has the MENU program by Robert Via and Line feed programs by Leonard Lorden

LFEED/CMD	Line feed add or removal
MENPAT/FIX	Remove time and greeting patch
MENU/ASM	Source Code for Menu/cmd
MENU/CMD	Menu program
MENU/DOC	Documentation for Menu/cmd
MENUMOD/BAS	Menu modification
MSCR1/MEN	Menu files
MSCR2/MEN	Menu files

CLARIFICATION

By David P. Miller

(Regarding the article "This 'n' That" printed in Computer News 80, Volume 6, Number 1, January, 1993.)

As noted in the Editor's comments following my article, the release of a storage format does not imply, explicitly or implicitly, the release of the data actually stored in that format. When releasing PostMaster graphics formats to the Public Domain, I possibly failed to make completely clear exactly what was being released. The formats used in storing the fonts, borders, and icons have been released, but not the graphics images themselves. The intention here was to provide programmers a means to use a predefined file structure with graphics libraries available, which in turn automatically allows the end program user to obtain volumes of graphics for use with their programs.

As with the /HR graphics file format, standardization permits development of programs to use the graphics files that may be available, and libraries of graphics files can be developed and obtained from such sources as the File Cabinet, releasing the program author from the burden of generating extensive libraries of images while at the same time making such libraries available. The end result is less work on the part of the programmer, resulting in better and more numerous programs, and a wide selection of files available to the user.

With the availability of numerous Font, Border, and Icon files currently in the File Cabinet, a programmer could work on a (for example) word processing program with the knowledge that end users would be able to obtain libraries of graphics files for use with the program; this is exactly my intent in making the formats Public Domain. With standardization comes wider availability of products and better support. Imagine, if you will, a What-You-See-Is-What-You-Get (WYSIWYG) word processor that could load and use any of eight PostMaster fonts at a time, display the text in full graphics glory as you typed, and import borders and icons to be placed anywhere in your document. Such a program is possible on a Model 4 and would elevate our machines to a level that would match any desktop publishing program available for the "PC"!

-David P. Miller

Dave's Mouse Menu

by David P. Miller, (C) 1992

($15 plus $4 S&H)

Dave's Mouse Menu is an Immediate Execution Program (IEP) designed to replace the file SYS13/SYS on your system disk. When this program has been installed, typing an asterisk ("*") at the DOS Ready prompt will cause DOS to execute it. As a replacement for SYS13/SYS, Dave's Mouse Menu is treated by DOS as a system file and considered part of the Disk Operating System (DOS). To install the program, simply place the distribution diskette in a data drive and type the following command: (Note that 4.5K of free space must be available to install this program.)

```
COPY DMM/CMD:d SYS13/SYS.LSIDOS:0 (C=N)
```

(':d' is the drive number containing the distribution diskette.)

WHAT WILL IT DO?

Dave's Mouse Menu replaces the "TRSDOS Ready" (or "LS-DOS Ready") prompt with a simple, easy to use menu system. Up to twenty six entries of your choice can be typed into the menu, with each entry consisting of a prompt to be displayed on the menu; a DOS command to be executed when a selection is made; and three parameters, or items of information that affect the way a command is processed. If no keys are pressed while the menu is displayed for fifty seconds, a screen-blanking routine takes over and prevents video 'burn-in' until you are ready to proceed. Pressing any key restores the menu.

Once a menu has been designed, you may simply press the letter key corresponding to the selection you desire to execute, or use the arrow keys to position the reverse-image cursor bar to the selection desired, then press the <ENTER> key. The program you specified is 'launched' and you may proceed as if you had typed the command from the DOS Ready command line. To create a menu, simply press the <F1> key and the Editing screen will appear. This screen displays up to fourteen menu prompts, commands, and their parameters at a time, and allows several editing operations as indicated on the screen.

Three choices are available for each entry when creating a menu. The first, 'Input Parameters', is used when a program requires some additional information to run. For example, your favorite word processing program probably needs a document file name to begin work on a document, or you may have several BASIC-language programs that you may wish to run at different times. In the latter case, the command would be 'BASIC', and parameters would be specified. When BASIC is executed from Dave's Mouse Menu, a prompt appears first in which you can type the name of the BASIC program to be run, along with any additional parameters such as memory size, number of buffers, and so on. Simply pressing the <ENTER> key at the parameter prompt will execute the program without parameters.

The second choice permits you to tell Dave's Mouse Menu if you wish to return to the Menu after your application program has executed. If you respond by pressing 'Y' to this question, Dave's Mouse Menu will re-appear after you have finished running the program in question (but ONLY if DMM has been installed as noted above, in place of SYS13/SYS.) If you select 'Return to Menu', the third and final question, 'Pause', allows you to tell the Menu to pause while you examine the screen. When this option is selected, the program will be run as usual, but when it is finished, a prompt will appear on the bottom line of the screen indicating that you should press the <ENTER> key to proceed. Doing so will again bring up Dave's Mouse Menu. This option is handy when executing such commands as 'FREE', 'DIR', and 'DEVICE' from the menu.

If you desire to exit Dave's Mouse Menu at any time, simply press the <F3> key. A prompt will appear asking you to verify this action, and by pressing 'Y' (or the <F3> key again), you will return to the normal TRSDOS/LS-DOS Ready prompt.

RUNNING FOR THE FIRST TIME

The first time Dave's Mouse Menu is executed, no menu file will be available (unless one is supplied on the distribution disk - look for "DMMENU/MNU"). Instead, a 'default' menu is used with a prompt indicating that a menu must be created, and with a "DIR" command. The Editing screen appears automatically. After you have created your menu, you will be asked if you wish to save the results.

ADDITIONAL FEATURES

Dave's Mouse Menu is designed to be a 'polite' program. If you have a high-resolution graphics board and the graphics screen is left on by another program or due to unexpected results, the graphics screen will be turned off and the text screen turned on. When exiting from Dave's Mouse Menu, either to DOS or to execute a program, the 'high-bit' routine is turned off, preventing the display of odd characters in place of block graphics.

If you have installed David Gobens' Mouse Plus driver, it will automatically be recognized and you may use a mouse effectively. The mouse will move the cursor, the left button (LB) is used to execute a menu item, the right button (RB) to exit to DOS Ready (LB to abort, RB again to verify), and the middle button (MB) to enter the editing screen. When using a mouse, the keyboard is still required to edit the menu selections and enter parameters before running a program. The original X- and Y-sizing and sensitivity will still be in effect after exiting Dave's Mouse Menu. If David Gobens' Mouse-to-Keyboard (MTK) emulator is installed, it will be ignored, but still in place upon exit.

TIPS AND TRICKS

You will no doubt find many effective uses of Dave's Mouse Menu, but the following will help you get started.

A 64K system Ram Drive can be installed with Dave's Mouse Menu in place if SYS0/SYS is left out. Since SYS0/SYS is only used to 'boot' up (start) the computer, it serves no purpose on a Ram Drive. Instructions for this can be found in your DOS manual. If you use GrafDisk by David Bowman, this configuration can be loaded from diskette in under eight seconds, and subsequent Menu operation is literally 'in the blink of any eye'. Follow the GDLOAD command with an asterisk ("*") to invoke Dave's Mouse Menu.

NOTE: when using GrafDisk, it is NEVER a good idea to attempt to use Graphics Memory as a disk drive! Since TRSDOS/LS-DOS has no scheme to mark this memory as 'protected', any other program that uses this memory for any purpose can cause reboots (or worse!) of your computer. Loss of data from your drives could conceivably result. Therefore, always use the (A) parameter with GrafDisk. One common method for a program to test for graphics board type is to place a value in the 'unseen' area of graphics memory and see if it remains the same; not all programs restore graphics memory to the original state after this is done.

When installing the TRSDOS/LS-DOS MemDisk with a JCL file, the asterisk should be the last command in the file.

NESTED MENUS

When using Dave's Mouse Menu with a floppy disk system, the twenty-six item menu should be sufficient. When using a hard drive, however, this limit quickly becomes restrictive. A series of menus can be created and used easily with a simple 'trick'. Design your 'base' menu, exit to DOS Ready, and copy the menu just created ("DMMENU/MNU") to another name on a drive other than the system drive '0' (such as "MENU1/MNU:1"). Return to Dave's Mouse Menu and continue this process until all your menus are as you wish. Each menu should have a selection allowing movement to another menu. This selection would have a prompt of "Go to the Games Menu" or whatever is appropriate, and the command would be "COPY MENU1/MNU:1 DMMENU/MNU:0". When this command is executed, the menu desired is placed on drive zero, and return is made to Dave's Mouse Menu, which uses the file by the name of "DMMENU/MNU" on the lowest numbered drive on the system. This method will enable you to move freely between as many menus as you need and have storage space for.

Naturally, if this method is used on a floppy- or hard- system drive zero, the last menu selected will be 'brought up' the next time you use your computer. However, this technique is particularly useful when a system Ram Drive is used, as the menu file in use is lost when power is removed, and the actual "MMEZMENU/MNU" representing your 'base' menu will be used for each new power-up session. The biggest (and perhaps only) drawback to using a system Ram Drive is that this memory will not be available for programs such as VisiCalc or BusyCalc, and some programs (such as BCX) may not even run without it.

To avoid such problems, and allow multiple-menu use on a non-RAM drive system, keep all your menus on a drive other than system drive "0", and set up your initialization in such a way that your 'base' menu is copied to DMMENU/MNU on your lowest-numbered, non-write-protected drive. An example of such an initialization routine might be:

```
MOUSE
COPY MENU0/MNU:2 DMMENU/MNU:1
*
```

-David P. Miller

A VISIT WITH DAVID GOBEN
by David Goben

WINTER BUG BITES

I'm really starting to hate non-gate array Model 4's with MicroLabs hi-res boards. Thanks to the efforts of Gary Shanafelt, we now know what causes my hatred. The basis for my ire is that the first version of MagicDraw produced weird lines only on those systems arranged as previously described. All other configurations or combinations work wonderfully! Apparently an undocumented featured of the MicroLabs hi-res board in connection to port 142 (hex 8E) is the culprit when connected to non-gate array computers, both 4 and 4P (non-gate array is the "old", or original Model 4 version -- the gate array version, such as the Model 4D came later, and work fine). Gary simply patched the two references in MagicDraw to that port to null values, and it worked great. So I turned around and applied a change to MagicDraw to get around this and issued it to CN80 as version 1.0.2. Unfortunately an oversight on my part actually caused the program not to work at all on =any= system. (oops.) Quickly, our hero kicked out version 1.0.3 and sent it to CN80. As always, the staff at CN80 quickly mailed out updates each time. However, this time the program worked ok on Radio Shack hi-res boards, but did not work =at all= with MicroLabs boards (at least the first version - 1.0.1 - did on gate-array Model 4's with MicroLabs boards). Can't blame CN80 for not catching it -- they do not have a non-gate array computer with MicroLabs board set up. Ron called me up. Stan was out and he and Lynn were left to run the ship. Ron sounded like he was ready to reach through the phone and grab me around the neck, and drag me, kicking and screaming, through the phone so I could fix the problem. Fortunately, before our conversation was over, I located the problem and had subsequently issued version 1.0.4 (amazing the speed of a desperate mind). Those of you who have MagicDraw already have this version. I thought that it might be fun to explain the problem, and why some of you were receiving non-working updates. (I'm sure I am sitting on the top of Stan's "favorite" list right now, considering the expense that they went through to mail out those early buggy updates.

I suppose that exemplifies the problem of trying to develop software to work on machines that you personally do not have available. Again, Gary Shanafelt was a =big= help in this department. Some of you will recall that Gary was also the man who, through user-testing and feedback, helped me to debug my original mouse driver (call the CN80 Mouse Driver) so that it would work on 2-button mice. He was also a tremendous help in reporting problems while I was developing the banking routines in HYPERBNK/CMD that I included in my Busy-Calc and BCX packages and the Disk Series which allowed banking support for Anitek's Supermem and Hypermem extended memory packages without the user having to resort to extensive patches.

Speaking of Gary, get hold of the File Cabinet M4HRZ24 disk to get a copy of his HRTURN/CMD program (Hi-Res TURN). This program rotates the picture on the hi-res screen. It works =exceptionally= well and I commend him on it. He is one of the few programmers who still uses compiled BASIC. But what he does with it is wonderous. I hope that he will veer toward Small C, where compiled C programs will work much faster and use up a lot less memory. Thanks for everything, Gary!

MAGICDRAW Q & A

A couple of users have complained that when they use MagicDraw, that they cannot reach the right-most or bottom-most points of the hi-res screen. The answer is that there is not a bug in MagicDraw that causes this. Instead, be sure to use my MOUSE+ mouse driver, version 1.2 or higher. MagicDraw will work =wonderfully= with it. I cannot guarantee results with other mouse drivers, nor should I be expected to patch MagicDraw to work with them. After all, I was the one who defined the current Model 4 mouse standard that MagicDraw uses. Therefore my driver should be considered the defacto standard. Therefore if someone else's driver cannot work as well, or perform identically to my driver for which the standard was defined, then that is certainly not my problem.

One person noted that if they are in the middle of drawing a line using the LINE pointer, and while drawing the line, select the menu and choose another pointer, that a copy of a pointer, usually the menu pointer, will have a copy of its image left on the screen. My response to this is to complete an action before selecting another one (the internal mechanics of the menu driver is extremely complex, and if I tried to change it, another problem would no doubt pop up). Therefore, either complete the drawing of the line and =then= select a new one, or abort the operation by clicking the right mouse button before selecting the menu. This problem is usually accidental anyway. This may most often happen on a 2-button mouse where one must press both mouse buttons simutaneously to select the menu (on a 3-button mouse, you select the menu by simply clicking the middle mouse button). If you press the left button first and wait an instant too long before the right button is pressed, the mouse driver, and subsequently MagicDraw will instead at first assume that you are choosing to execute an action, and so will begin such an action, such as drawing a line, before the twin-button press is registered as a "select menu" command. To avoid this, always be sure to press the buttons simutaneously, or better yet, get a 3-button mouse. By the way, as I was exploring this minor problem, I noticed that it was less likely to happen with my MOUSE+ driver. MOUSE+ allows more of an intervening delay before reporting an action, thus the chances of a mistaken twin-button press are less likely to be encountered. Although it can be if you work at it by intentionally separating their presses. The best method of getting around this is to be sure that if you are one that for some reason cannot seem to press both buttons at exactly the same time, you should at least press the right button first. The right button tells MagicDraw to abort any operation it is currently performing.

And so my advice to anyone who is considering MagicDraw is: get my MOUSE+ mouse driver for optimum performance (you can reach the right and bottom ends of the screen with it). Also, get the 3-button CN80 mouse. It is my mouse of choice. Sure, you may be able to obtain another mouse cheaper at some bargain basement, but you will certainly be hard-pressed to get one of better quality and workmanship. Considering that the Microsoft mouse costs about $90, and is the result of over one million dollars in development, the manufacturers of the CN80 mouse took advantage of Microsoft's sweat and developed their own mouse that is of like quality, but costing only $26.95.

SMALL C IS HERE (finally)!
($45 plus $4 S&H)

Yep, well before the last issue of CN80 was shipped to you, but too late for an announcement to be inserted, my MODEL 4 SMALL C package was delivered to CN80. It is 226 pages long, and =packed= with information. It is written in my usual conversational style, and hopefully has enough humor sprinkled throughout it to keep things interesting. Unlike most of my other manuals, I have written this one using a 12 point font, as opposed to my usual 10 point font (the characters you are reading right now are 10 point). I did this to allows easier reading on your part. It also keeps the manual from appearing overwhelming.

The format used in writing the book is a bit deceiving. It is very complete and concise, but the people I tested it on did not think they actually retained very much until they either tried reading it again, or examined some other C manual, whereupon they realized that they were now much more intimately familiar with C programming than what they thought. This is the purpose of the writing method I used. If I had used a tutorial approach, the manual would be over 500 pages long, and would have subsequently cost you over $100. Don't want that! Therefore I adopted the 2-pass method, and called the manual a reference manual. What I mean by 2-pass is that the manual should be read =twice=. The first time to familiarize yourself with the C language. And a second time, this time as a knowledgeable reader, to really absorb the meat of the manual. This same style is becoming more popular with other books in the general popular press as well, and is an adaptation of the self-learning, or self-paced learning manuals originally pioneered by the US Army (I might add that I was involved in the testing and evaluation of this method before the civilian world adopted it).

My first test subject for the Model 4 Small C manual was my cousin. Here is a person who has trouble pouring water out of a boot, even if the instructions are written on its heel. He read the manual and swore he did not retain a thing. Then I began discussing C programming methods with him, to discern if this were true. To his own amazement, he not only completely understood what I had said to him, but he was in fact able to add to the discussion by elaborating on my points. And so a person who previously remembered only 2 commands while trying to learn BASIC (they were RUN and SYSTEM) is now happily writing his own complex C programs. I've created a monster.

C is an extremely powerful language that is incredibly easy in structure. To exemplify this simplicity, consider the following simple 1-function example:

```
/* CPY/C: sample program */
#include <stdio.h>

main() {
  char ch;
  while((ch = getchar()) != EOF)
    putchar(ch);
  }
```

The first line is a comment. A comment is marked by beginning with the consecutive characters "/*", and ending with the consecutive characters "*/". The next line is called a "preprocessor" command. This tells the C language preprocessor (built right inside Model 4 Small C) to include a file called STDIO.H. It is actually called STDIO/H on the model 4, but the period separator is allows for compatibility with other computer systems, such as CP/M, MS-DOS, UNIX, and so on. This file contains standard definitions for C programs, such as the EOF value, which represents the end of file flag.

A functional C program always has a function called "main()". This is the module that is considered the program entry point for all C programs. The braces, "{" and "}" are used to mark the beginning and end of a "block", which we define as the body, or content of our main() function (all self-contained modules in C are called functions).

Next we tell C that we want to define a variable called "ch", and define it as storing a character-sized value (these types store a single byte, or character in memory).

Next we assign ch with whatever is returned from a function called getchar(). This is a "standard" C function that obtains the next character from the standard input file (usually the keyboard, but can be redirected, as we shall soon see). We also at the same time test to see if this obtained character is the same value as the EOF value. If it is not (we can visualize the "!=" symbols to mean NOT EQUAL TO) then the value stored in ch is sent out through the putchar() function, when sends the character to the standard output file (which is usually the computer screen). As long as (while) the value is not equal to EOF, this is done. However, as soon as the values =does= equal the end of file value, then the "while" loop is broken, and control of the program continues after the while loop. Because there is nothing more after it, the program ends.

Suppose we called this program CPY/C. We could use the Model 4 Small C package to compile it to a program called CPY/CMD. But what could we do with such a simplistic program? PLENTY! For example, if we simply entered the command:

```
CPY
```

we could type on the keyboard and see what we typed on the screen. By the way, we break out of the program by pressing the BREAK key. Big deal, right? Well, by using the redirection commands, we can do a lot more. For example, using the following command:

```
CPY >*PR
```

whatever we type will be printed on the printer. Using the command:

```
CPY <FILE/TXT
```

we could display the contents of the text file called FILE/TXT onto the screen (we can use SHIFT-@ to pause). If we used the command:

```
CPY <FILE/TXT >*PR
```

we could print a copy of the file FILE/TXT on the printer. The command:

```
CPY >DOLIST/JCL
```

will copy whatever we type into a file called DOLIST/JCL. Remember to press BREAK to end the session. This is kind of like using the BUILD command. The command:

```
CPY <FILE/TXT >DOLIST/JCL
```

will copy the data in FILE/TXT to the DOLIST/JCL file. We can also use the command:

```
CPY >>DOLIST/JCL
```

to type =more= text to the end of the DOLIST/JCL file (note the double right angle brackets).

I think that the really great thing about programming in C, or any other modular language, is that if you need a function that does not yet exist, you can create it. You can also create your own library of functions that you can use when developing your programs. In fact, if you want to ignore an exiting function in a support library, but wish to use the same function name and have it operate they way you want it to, you can write it into your program, and the one in the library will be ignored.

The beautiful thing about C is that its actual language consist of only about 26 keywords. The rest of it consists of math, binary, and logical operators. Thus the language is easy to pick up, but what you can get out of this simple list is the ability to easily write complex functions that are difficult, if not impossible in other supposably more powerful languages. That is why C is becoming so popular, and is the language of choice by both novice and professional programmers alike. Indeed, anyone who wishes to work in the general programming field will usually be asked: "Can you program in C?" So if you wish to answer "C!" to that question, then step on board and find out what it's all about. Get your hands dirty with Model 4 Small C and discover that programming can indeed be fun (and addictive).

PRINTER WOES

A reader has so far obtained three printers in an attempt to get one to work in the graphics mode. The first was an RC ALLEN Dot Matrix Printer (?). Never heard of that one. The second was an Epson FX80 (good choice!). The third was an old TRS80 DMP100. To complicate matters, attempts to print to the DMP100 results in an I/O error. Well, this error may be due to the selector switch on the back of the printer. If the computer is trying to communicate with the printer in the usual parallel mode, and the switch is set to either the 600 or 1200 baude settings, you will get this error. Change this selection to PAR (for PARallel) by sliding the switch. Once selected, the examples that the reader referred to in the "How To Use Your Radio Shack Printer" book will work on this printer, remembering that this printer uses standard DMP graphics (Radio Shack 7-pin graphics), and uses CHR$(18) to turn on the graphics mode, and CHR$(30) to turn it back off.

The Epson FX80 uses standard Epson 8-pin graphics, and uses a slightly more complex, though faster method of printing graphics. A discussion of Epson graphics was given a few issued back. Also, because Epson and DMP graphics are not compatible, trying to run the DMP examples on the Epson are not possible, but will in fact dump a bunch of garbage on your printer. Every Epson printer I have ever seen produced, including the FX80, comes with a well-written manual that not only explains the graphics mode of the Epson printer in detail, but also includes many good examples, to include explaining exactly how these graphics are formed on the printer.

DEA AND MODEL III MULTIDOS

Using the A/GO command from DEA under Model III Multidos does not work. What this command does is supposed to assemble a program and immediately execute it, and then return control to the DEA editor. Unfortunately on Multidos this does not happen because of the way Multidos was written, and because of that a portion of DEA is always overwritten by the DOS. The method I used for supporting this command was made as general as possible to work on as many operating systems as I could test it on. Unfortunately, due to a severe dislike for that DOS, I probably did not take the time to test that feature. I'm getting quite frustrated with the rainbow of operating systems that bloomed for the Model I and III. The major stumbling block for most of them was their incompatibility with their standard DOS, which was TRSDOS 2.3 on the Model I, and TRSDOS 1.3 on the Model III. The only DOS systems that came even close was LDOS 5, which has my full support. Even though I myself used to be a big fan of the I and III versions of NEWDOS/80 Ver 2.0, anymore I would not touch them with a 10-foot pole, now that I realize their incompatibility with the standard fares. Of course, at the same time, if you enjoy them, then forget what I say. As long as you are happy, stay with it.

PERSONAL HELLOS

I do a lot of traveling. Unfortunately, after I complete a trip, I usually find out =then= that I may have stopped next door to a reader, or drove right by their home. Once I actually unknowingly stopped at a subscriber's house to ask directions. He didn't know me by name. I didn't know him. For example, in the recent past I discovered that I have driven by subscriber Richard Favre's home on several occasions. He lives in St. James, Missouri. A delightfully nice, friendly, clean little mid-west town that is the home of Boys Town of Missouri, and in friendly proximity to some wonderful wineries. I have a brother named Jim and his wife Tammy, along with my newest nephew Justin, who lives in that burg, who I like to visit. (Strange how almost the entire "tribe" of Goben's moved to that state, and consequently now everyone here in Connecticut thinks that I'm from there as well. Must be my Iowa accent.)

CONCLUSION

Well, this wraps up another chapter of my rambling. Let me know (don't wait for someone else) if you would like to see a series of tutorials in using Model 4 Small C. The reason that you haven't seen any Symphony 90 articles, as I had once promised, is that no one responded to say they wanted to see them. I have all the material, but why bother if no one is interested? Hopefully Small C will be the stepping stone from BASIC to some real programming power that is not only applicable to you personally, but can be expanded to support you in your job or on the business front as well. Or would I be wasting my time? Let me know.
-David Goben

REMINDER

If the last four digits on your mailing label are 93/03, then this is your last issue. Time to get your renewal in the mail.

Moving?
Remember to send us your new address.

ART NOUVEAU ICONS
by Gary Shanafelt

If you're enjoying printing hi-res pictures as I am and have a high-density printer capable of 240 or 300 dpts per inch, you're probably both intrigued and frustrated by all the icons that have been converted to Dotwriter or PostMaster format in the last year or so. These things can really brighten up a hi-res screen. But if you print them at the highest resolution of your printer, what looked big on your screen comes out like a pinpoint on your paper. I have a DeskJet, and a few decorations can really enhance a page of text. But PostMaster icons were designed for printers printing at 100 or 120 dpi, not 300, and they are small.

So, I put together the icons on this disk. The Mucha decorative is taken from a MACPAINT file using Frank Slinkman's MAC2HR utility; the others I scanned from various sources on a MSDOS machine, converted to HR format for the TRS-80, and finally hand edited for clarity.

So how do you use them? I print my text as usual, leaving space for the icons. Then I load MDRAW/BAS, a hi-res file editor, do any final editing or centering of the image I want, or block out what I don't want if there is more than one icon on the screen. Finally, I run HPPRINT/BAS, a utility to print hi-res screens on HP LaserJet or DeskJet printers, and position the image where I want it on the page (HPPRINT allows you to set the margins or center a screen automatically). While the result involves two passes of the same page through the printer to combine text and graphics -- and usually a few trial runs to make sure everything is lined up properly -- the result can be quite nice. Of course, you can use the same technique with any HR file, not just those on this disk: they make excellent page decorations.
-Gary Shanafelt

Note: The Hi-Res picture files that Gary has submitted are of excellent quality. File Cabinet HRZPIC90: Art Nouveau Icons HRZPIC91: Old time woodcuts & Engravings.

FLOWxDBL/BAS

by Henry H. Herrdegen

A program to flow check for the III and 4. A CodeWorks PD program to list program branchings, enhanced and adapted for TRSDOS 1.3 and LS-DOS 6.3 by Henry H. Herrdegen. (See program listing number one and two.)

Recently, I came across an interesting programming help on an old CW disk, FLOW/BAS, and wish I had stumbled over it sooner. It scans an ASCII saved BASIC program, and finds all (almost) Goto lines and addresses. "Goto" in this writeup stands for GOTO, GOSUB, RESUME, etc, all program branches.

The "DBL" in the file names indicates a double column printout for the first part, the plain Goto list. After running pages and pages on tryouts, the empty right half, with the column only 29 characters wide, bothered me, wasting paper and filing space. Adding 3 lines and a few other changes made it roll back the paper and print a second column. That is on a DMP 200. We'll discuss later on what to do if your printer needs different code, or you don't want it.

The opening screen of FLOW3DBL/BAS and FLOW4DBL/BAS asks you for the name of the program to be examined, reminding you about the ASCII format, and if you want hard- copy or not. This filename then stay's on top of the screen, the file is opened and the lines scanned for Goto commands. Line number, command, target line number, and if conditional, is then displayed, and if so selected, printed. Line numbers and command classification are stored in 3 arrays. The file is then closed, the data sorted, first for command class, GOTO, GOSUB, conditional or hard, then in ascending order for the target lines within each class. The sorted data are then printed, target line, class, and the line(s) called from. The screen is paginated 20 lines on the 4 and 12 on the III, asking for a Space Bar press to continue. The hard copy prints the filename, date and page number, and 54 lines of listing on each page.

When I said "almost", it refers to the fact that it only reports the line "a" in an "ON x GOTO a,b,c" statement. Not a big problem, as these "menu" addresses are obvious. The original program treated this "ON x . ." as well as an "ON ERROR . . " as "hard" Goto, but I think they are conditional, and changed the program accordingly.

Other changes made are the paginating, use of "INKEY" for hard copy choice and screen paginating, use of the "SWAP" facility in our LS-DOS, as suggested in the original, eliminating the "DIM T(650)", but retaining the original swap code for the III. But with a little change. The original second level sort gave the line numbers in descending order, why? Nobody knows. Me thinks everybody, at least on this continent, reads a program from the top down, so the "=<" in L 61 is turned around. I also did some re-formatting of the print lines in order align the numbers and provide a margin on the hard copy pages, condensing and re-numbering the code. With the DIM's set up, 10K are occupied on the III, but only 7.5 on the 4. The program itself is 3.5K long.

I put the main "select and print" subroutine on top, to at least speed it up a little bit, but wrote the not so time significant pagination subs at the end. The line numbers and their code functions are the same in both programs, with only the code changes required to suit the different screen sizes and BASIC differences. Makes a comparison easy.

But slow it is. To list it's own record, with 34 branches, takes about 3.5 minutes on the 4, and 9 on the III, with multiple disk accesses. But it will take you probably much longer to find all of them in a program printout. On the 4, I put a beep in when the screen is full and waits for your examination and pushing of the Space Bar (L 72), in case you had gotten up to brew a cup of coffee. A little screen notice will tell you when it's working hard on sorting, up to 15 minutes on the III and the longest program I have checked so far. I also re-activated the cursor on the III (L 10, 11 & 33), to indicate that it hasn't died yet. The original REM lines suggest to compile the program for faster speed.

To help you to analyze the program, here is a short description:

L 0 - 5: Credit Rem's
L 10 - 14: initiation, with L 11 & 12 the

new "PRINT USING . ." format strings to line up the second part printout.

L 15 - 25 is the moved up "find and print" subroutine, where the flags E, E1, E2 & P select the classification of the Goto, what to print and to LPRINT or not, the arrays are filled, and the line count N is incremented. The "A" array holds the originating line number, "B" the target line, and "C" the class: 1-conditional GOTO, 2-hard GOTO, 3-conditional GOSUB, and 4-hard GOSUB. The class number is used in sorting and selecting the print text for the second print block (L 53).

L 26 - 34 print the title, ask for input for the filename and hardcopy or not.

L 35 - 45 open the file, read one line at a time, check it for relevant numbers and code, set the appropriate flags and invoke the print subroutine.

L 46 - 52: the two sort routines, the first one to sort by class, and the second one by target line number within each class.

L 53 - 69 is the "consolidate routine" (original terminology), which prints the second block, consolidating (?) multiple originating lines to the target line. (the paginating and line alignment forced slight code changes here, and the introduction of the EQ flag and LA character counts).

L 70 ends the program.

L 71 - 73 paginate the screen, as L 74 - 81 do for the hard copy. C is the "consolidate" flag, indicating the close of the file and start of the sorting and secondary block printing, and R is the "reverse feed activated" flag, indicating second column printing.

L 96 avoids "widow lines" at printing the second block, and gets a new page.

Now, L 74 holds the roll back code, the loop to LPRINT CHR$(27) CHR$(10). That works on my DMP 200 and in LS-DOS, the "27 10" being the code for a full line reverse feed, according to the printer manual. For some reason, in TRSDOS 1.3 the "10" never worked, neither on my old III, nor on the 4 in III mode. Have to use the 1/2 line reverse, CHR$(27) CHR$(30), and double the loop count. Anybody out there can educate me why? The additional (55th) count is to compensate for the regular line feed it does at the end of the roll back. This too may be different on your printer, to leave you with a bit of programming.

If your printer needs other code, you can change it there. Or, if you can't make it roll back, or do not want the double column printout, simple bypass the line 74 by making it a REM line, preserving it as address for L 71, and maybe for later use. Since the flag R will not be set, all other references to it are meaningless, and lines 18, 20, 22, 24, 78 and 82 don't have to be changed, and 75 and 76 don't have to be deleted. But then, that's up to you, anyone interested in this program is probably versed enough in BASIC programming to see that anyway.

Other than for that strange quirk, the main differences in the III version are the additional line 63, restricting the screen print length, the different sort code in 47 and 51, and the different "TAB"s in the title section.

Thanks to the unknown author for the bare bone original, its code is only changed where necessary for the pagination and the different BASICs. I just added a few bells and whistles to flesh it out the way I like my programs. Why did CodeWorks never credit a person?

keep the 80 humming!
- Henry H. Herrdegen

ADDRESS LIST BASIC PROGRAM
by Robert Knowles

(Program Listing Number Three.)

Did your boss ever come to you at five minutes to five and put a hundred index cards on your desk and say I want these in order and a hard copy by five, well we all know that's not possible and so does he, he is just saying he wants them as soon as possible but before you go home, you can just see nine coming and going and you still haven't had dinner. Well, this program won't sort your cards for you but it will make life a little easier. Look at it, put it in and if you don't like the way it prints things you can always change it to fit your needs, put it all in first to see how it works then change it if you need to.

LPRINT is code and means send this to the printer. As you can see there are mostly print, lprint and input commands, the print prints it on the screen, lprint sends it to the printer and input asks a question on the screen and will save the answer until the line that tells it to send it to the printer is read. 10 Is clear screen, 20 is three lprints and will advance the paper three lines so be sure the paper is lined up with your print head, 30 prints "ADDRESS LIST" in the center of your paper, (this is taken with the margin all the way to the left) if it doesn't print in the center of your paper adjust it. You do that like this: First you take the width of your screen, mine is 80, (I have a DMP130A)Then count the words and spaces 12, take 12 from 80 which is 68 then divide 68 in two and make that your tab stop. It should look like this 80-12=68/2=34 and 34 is your tab stop. you don't have to put 34, you put what looks good to you. 40 is lprint which is a blank line to make your hard copy look better, 50 you can see that it prints the column heading on your paper, line 60 is a blank line on the paper 70 is a blank line on the screen. 80 to 160 are input lines that print on your screen and asks a question. Answer each question and press <enter>, your computer saves all the answers until all the questions have been asked then prints them all at once, 170-200 tells your printer to print everything that you just entered and where to print it. 210 is a blank line to make your work look better. (You have this big expensive computer so why not make things look as good as possible) 220 takes you back to 70 and asks the questions all over again so you can enter as many addresses as you have without stopping.

I used my statement program and it works just fine but I didn't like it, the total didn't stand out well enough so I fixed it so that it does. I won't tell you how I did it unless asked, it will make a good exercise for you. First I made an image line with dollar signs and a comma(who knows some day we may have that much money), then I made a box out of asterisks and put the total in the middle of it. I don't want to cause you problems but if you don't try more difficult things then you won't ever be able to do the more difficult things. Be sure to test your program, not just once but many times, just once and you might miss any mistakes and if you send it to be published and it doesn't work people will think very unkind things of you.

FOUR PART BASIC, Part One

by Robert Knowles

(Program Listing Number Four.)

Sooo, now that you have had a look at how to put files in using basic maybe it will help you to understand what comes next. There are better ways of doing it, for keeping yearly records I think sequential files are the best. If I gave it all to you, you would take one look and ask "When was the last time you saw a psychiatrist?", so we will take it one step at a time.

It's a four part program, one program to put it on disk, one program to get it from the disk, one program to extend your file, in case you forgot something and the menu program to control it all.

We will start by putting a copy of basic in :0 and a formated disk in :1, name it phone and keep it only for the fone files. save it on :1, I call it simply PUTSEQ/PRO, for putting it on disk. It's yours now so you can call it what ever you like.

Line 10 is just the program name. Line 20 is <cl>ear <s>creen, it's easier to see what you are doing if there is nothing else on the screen. Line 30 is to open the file, you start with open, but then open as what? We want to put it on the disk so we must use O which means output to disk and it must be sent to a buffer before it is sent to disk so you must tell the computer which buffer you want to use, then you must be sure to name your program and tell the computer which disk you want it on. This one is for the phone company so what ever you name it will be in the directory and you can only use eight characters so I call it fone. Then I put the year then /seq for sequential, it looks like this "FONE0000/SEQ:1". When you are working on a file you put the year where the 0s are then you can always find the year you are looking for. Line 40 you can use /.$ in your program but it doesn't like. Line 50 is column heading to help us have a neat program. We have four headings and an 80 character screen so we take 80/4 and we get 20 so we start at the left and put in the heading, counting all the time to 20 when we get to 20 we start again at 1, putting in the heading and counting from the first letter to 20, and line 60 is the same thing, line 70 is line input;n$, input will put a ? which I find can get in the way so I used line input which gives you a clean line to write on, line 80 you must have a way to break out of the program and put it all on disk, after you have put in what you want and pressed enter, on the last clean line you type DONE (in caps) and the program is closed and every thing is put on disk, line 90 you must tell the computer to write the buffer to disk, line 100 forms the loop so you can put your data lines in. Line 110 is close 1, when you open a file you must always close it. Always be sure that the check number starts at the left edge and all data items are in the same place. Computers are very good machines they will only do what you tell them to do and only if you tell them to do it, they can't read your mind, they can only do what you tell them to do not what you want.

DON'T PANIC WITH PROBLEMS

I had a problem, I put in the boot disk for my hard disk and it didn't want to boot so what do I do now. First thing is don't panic. Sometimes when the computer acts up there is instant panic, there is a way of finding out what is wrong, first I used a new disk, that worked alright so I called up leScript, good that worked then I asked for this letter and it aborted so I changed disks again, that seemed to work fine. I get my letter and started to work on it. You should always save your letter to disk, you write a little, save it on disk, write a little more and save it to disk. This way if the power goes out you won't lose everything, I did that and it worked fine so I thought it must be the disk, they are like everything else they get old and worn out and must be replaced. I saved my letter to disk again and it didn't want to do it so I thought what do I do now, all the connections are tight, I could hit it with a stick but I don't think that would do much good so what didn't I check? I haven't checked the power coming out of the wall yet so I had a look and sure enough the plug was half way out and the hard disk wasn't getting the power it needed. The main thing in trouble shooting is do not panic, so what if you don't know about what is under the hood, a lot of computer owners don't but there are a lot of things that you can check.
-Robert Knowles

DOUBLE TALK PROGRAM

by Leonard Lorden

As a long time member of GEnie and a regular host to the real time conferences, the lack of a split screen terminal makes communicating a real headache. Several other GEnie users have expressed a long desire to have such capabilities, as the IBM'ers are able to enjoy.

I have heard rumors that Mel Patrick's Fasterm II terminal software had the capability for this, but I personally don't like FT as much as I do XT4.

Therefore, in an attempt to satisfy the entire Model 4 modeming world, I have created a split screen terminal which you load outside of your favorite terminal environment. I've titled the program "Double Talk" and appears to work under any RS232 controlled environment, i.e. if your terminal activates the COM/DVR routine or not. This program is just a simple dumb terminal utility and is not designed as a stand alone terminal package, though you could probably use it as one. This file program has been submitted to CN80's File Cabinet (M4UTL65).

Another file (on the same disk) I had submitted a few months back was a program called LFEED/CMD. If you find yourself creating text files that will/may be read by the IBM community, then you may find this utility quite handy. LFEED is a Line Feed utility, it will either add or subtract a LF code to any ASCII text file. It even has built in safeguards to ensure you don't double-up LF's in case you use the utility twice on the same text file.

I hope you find these programs useful.
-Leonard Lorden

BIORHYTHM GRAPH FOR THE III and THE 4

a PD program from CodeWorks, adapted for TRSDOS 1.3 and LS-DOS 6.3 by by H.H.Herrdegen.

(Program Listing Number Five and Six.)

Back in 84 I had copied a Biorhythm

program out of a book (for my then Model 3), and also played with a program on a Texas Instrument programmable calculator, checked both for accuracy with data in a book "Biorhythm - a personal Science" by Bernhard Gittelson and found both correct and interesting.

Coming across the CodeWorks program, my interest was rekindled, and I corrected it to run under LS-DOS 6.3, and another version for TRSDOS 1.3. What DOS it was written for, I don't know, but it had a 64 column screen text arrangement, and then the graph and it's text was in 80 columns, ok for a hardcopy, but the screen would have been a mess on the smaller III screen. The 1.3 version, BIORHYT3/BAS, needed some additional code and changes in the print (display) format, to accommodate the smaller screen. In the following, specifics only applying to the III, will be in brackets ().

It begins with a CodeWorks title block, then asks if hardcopy is desired also. The Y/N answer is an Inkey, caps or lower accepted. You are then asked to enter a name, but a blank does no harm. Next comes a question about the Birthday and the starting date for the chart, both in the MM,DD,YYYY format. It does seem to have no restrictions, but the accuracy for way out dates is difficult to verify, I may say.

Do not input any impossible or ridiculous dates. I did not add any date checks and rejections, and the program will accept even minus numbers. It may work, creating an illogical graph with crazy dates, or you may get a Subscript out of range or Illegal function error, or a scrambled print output.

If the option was for hardcopy, the program reminds you to check the printer, and states that 50 days of chart will fit onto one page, and are default. It then asks for the number of days you want. Just <ENTER> defaults for the 50, or enter any number of desired days. Entering '0' will get a repeat question in screen mode, and the default 50 at hardcopy. Printing starts with a title and the name and birth date of the chartee, an explanation of the 4 symbols for physical, emotional, intellectual and moon cycle, and a header, indicating minus side, zero, plus side, Index, Age in days and Date. If more than 50 days are entered, the pagination prints a sub title, page number, the header and another 50 days on each page. During hardcopy on the 4, the chart will also be on the screen, but scrolling . (The III, due to the difference in screen and hardcopy format, will only show the inputs and a 'printing chart' message.)

The screen only choice skips the 'printer and 50 line' reminder, and accepts any (but a 0) number for the chart days, but a negative number would not make much sense, would it? The screen shows the same heading (without the Age days column), scrolling up as the chart days are computed and shown. The '- 0 +' header (without an underline), will stay on screen and, 21 (14) days of curves and data are shown per screen. Pressing the <SPACE BAR> as prompted, will bring the next 21 (14) days, giving you time to study the three (two) weeks on the screen. At the end, the program shows the average Index for the period, as will the hardcopy.

This program also charts the moon phases, but I found that the original was 2 days out according to my calendar and corrected that, introduced an Inkey function, re-arranged some lines, condensed and renumbered it, but left the many REM's as to the function of the line or block of lines (almost) unchanged. So the program is easy to analyze.

All subroutines, original and added, have been put at the beginning of the program, in order to speed it up a bit. The III program is 7 lines longer, and, due to the difference in column and/or tab count, the curves appear slightly truncated on top, but are otherwise the same as on the 4 program, both checking out correct with the two programs and the book previously mentioned.

Most of the functions are adequately indicated by REM statements, but let me point to a few more items:
In L 10 the VF and VN is used to turn the jumping cursor off at displaying the curves, and turns it on when needed to indicate a required input. (this is not req'd for the III, but the line includes the added MS$ DIM for the screen format). L 14 sets PI to 2*PI, to avoid multiplying later on 4 times in lines 70, 73, 76 and 79 in order to establish X, otherwise the math algorythm is unchanged.

(L 17, 18, 20 and 21 are the additional DATA and READ lines.)
L 46 converts the birth day input to a string for printing.
L 53 and 54, if CP=0 is produced by just <ENTER>, repeat the input question if in screen mode, or set the 50 default days for hardcopy.
(L 60 holds the 'hardcopy' screen message.)
L 69 & 87 (68, 69, 87 & 88) establish and clear the (normal and additional shorter) A string. (The original length string for hardcopy is in L 68 & 86).
L 70 forces 5 digits for the age number, keeping the printouts aligned.
(L 85 composes the additional A string for screen output.)
L 87 & 89 (88 & 89) initiate the paginations.

L 50 and 95 hold the 686705 number for the moon phase, which was in the original 686707. Why? maybe some astronomer out there can answer that. The BIO/BAS had a REM line stating that the initial moon phase was based on the Jan 4 1880 New Moon, but it did not print the phase on that date correct with the original number, matter of fact, it required 686704 to show a new moon on Jan 4 1880! But the 5 gives a better present days match. Is the 29.5574 for the average moon period not accurate enough?

Added line numbers for the III are skipped in the 4 program, so most lines are identical in function, but may have changes to suit the two different systems.

Enjoy the program, even if you don't believe in Biorhythm, it can be fun.

keep the 80 humming!
-Henry H. Herrdegen

HOW COMPUTERS WORK

by Ken Strickler

COMPUTER STORAGE DEVICES

In present computer configurations there are three types of storage devices currently in wide use.

1) Random Access devices (RAM,ROM,PROM,EPROM)
2) Random/Sequential devices (DISKS)
3) Sequential Devices (TAPE)

RANDOM ACCESS DEVICES

A randon access device will obtain the requested information immediately, without having to wait more than a cycle or so, depending on the Memory Chip speed. RAM memory (either dynamic or static) will provide the fastest possible response to the request for data. ROM (Read Only Memory), PROM (Programmable Read Only Memory) and EPROM (Erasable Programmable Read Only Memory) also fall into this category. Read only memories are used to provide those functions which are set by the systems programmer, ie. the initial disk loading sequences. ROM Memories do not lose their data when power is removed, while RAM Memories only retain their data while power is applied. (The difference between DYNAMIC and STATIC memory, is Dynamic Memory has to be Refreshed, i.e. 'Recharged', to remember, and static memory needs no refresh cycle.) Memory access times for RAM'S and ROM'S can be in the Nano-second range, as required by the processor chip, to allow FULL SPEED operation. As speed increases, so does cost.

Before discussing the operation of a disk drive, let's review the physical layout, and terms that we will be using. The disk drive has two major components, one mechanical, and one electronic. The mechanical portion, contains 2 Motors, 1 to rotate the disk at 300 RPM (3600 RPM in a Hard Disk) and 1 to move the head in small increments (step) across the surface. If you have a floppy disk handy, let's take a look! The center hole (large one) usually has a plastic ring around it for reinforcement, is clamped into a drive hub, when you close the drive door or latch. Now the drive motor can turn the disk. You will notice a small round hole about 1/4 inch outside the drive hole. If you carefully turn the disk inside the protective case, there will be a small hole inside the little round hole. (Are you there so far?) Inside the disk drive there is an electronic circuit that recognizes that hole, and indicates to the drive that that is the beginning of a revolution. The 2 elongated slots provide access to the disk for the heads. The little notch on the edge indicates to the drive whether the disk is write protected (can be written on) or not. When covered, the disk is write protected. Now, for your imagination! Imagine that the disk has many concentric rings inscribed on the surface. (Remember, when we were kids, we would take a compass and draw a circle, then open the compass a little, and draw another circle using the same point? Maybe you didn't do that, but I confess, I did.) We will call each of the rings a track, starting from the outside track, we will number them 0,1,2 until we reach the inner most track 35 or 40 or 80 or 'n'. Now imagine this surface as the top of a cake or pie, and sliced into 10 or 18 slices. Each slice we will call a sector. That little hole which marked the beginning of a revolution, will now mark physical sector 0. Each slice then will have a number from 0 to 9 or 17. When the disk drive is initially turned on the controller card steps (moves) the head to the outer most track (Track 0). Now we have it! Track 0 through 'n', and Sector 0 through 9 or 17, so let's continue out story.

A RANDOM/SEQUENTIAL device, like a disk drive, starts from a known location, Track 0, and through the controller, skips large blocks of data, as the head moves to the selected track, then starting at sector 0, waits until the desired sector is available for reading or writing. Usually the disk head is positioned over the directory track, which can be placed during FORMAT on any track, but usually on the middle track (Track 20 on a 40 Track, or Track 40 on an 80 Track) in our Model I, Model III and Model 4 systems. Track 2 is very popular with the PC (8088 type) machines. If you consider that the Track to Track access time for a floppy is between 6 and 30 milli-seconds, and for example, the disk was double density, the information skipped would be 4608 (9216 Bytes if Double-Sided) bytes per step. At a 6 milli-second step rate, the disk drive stepping for 250 milli-seconds would SKIP 41 tracks, or 382,464 BYTES of data (if the disk drive was double-sided). The floppy disk rotates the disk at 300 RPM which is = 200 milli-seconds/revolution (300 / 60 = 5 REV per second = 200 milli-seconds per revolution.) This is substantially slower than RAM, but much faster than tape. I should point out here, that in a double-sided drive, first head 0 is used, then switched to head 1 before stepping to the next track. This means that sector 0 thru 17 are on side 0 and sector 18 thru 35 are side 1. The operating system, with the disk drive controller, takes care of the details handling the disk drive. Now if the disk drive is a hard disk, at 3600 RPM, each revolution is 16.666 milli-seconds, with a step rate as low as 10 micro-seconds. (The 5 MEG Radio-Shack Hard Drive has a 3 milli-second track-to-track step rate, 4 heads, 32 sectors per track = 128 sectors before head step, if configured as a single device.) As you can readily see, the hard drive is substantially faster than a floppy. The same 250 milli-second time used for 41 tracks on the floppy would be 82 tracks on the RS hard drive. Let's see, that's 32 sectors per track * 4 heads for 32,768 Bytes * 82 tracks = 2,486,976 Bytes skipped! With higher capacity hard disks, containing more heads and tracks, the access seems more and more random! Try that on a tape!

Before I leave this area, I will mention that there are 2 other -invisible to the user- hardware requirements. The experts out there will recognize interleave and skew. In order to easily understand the need for these, a little explanation on interfacing to the CPU is required. The CPU runs in real time, ie. in relation to the clock on the wall. After a sector is read, time is taken to check to see if the real time clock needs to be updated, and if so, it will be incremented, then if type ahead is enabled, the keyboard is scanned to see if the human out there has finally gotten his finger on/off that key. Of course, a CYCLIC REDUNDANCY CHECK (CRC) is completed to insure as much as possible that the data read from the disk is not garbage. If all this activity is OK, we are ready to read the next sector. While all this activity was going on, the disk drive was still spinning, and is now somewhere in the next sector, not at the beginning! We could wait for the next revolution to get the next sector, or we could (here it is folks) interleave the sectors, i.e. Sector 0 followed by a sector other than Sector 1. By knowing the speed of the CPU, and the amount of work to be done, we can calculate the number of sectors we would have to skip. (In our systems, the floppy disk has a 1:3 interleave pattern, meaning Read 1, Skip 2.) At 200 milli-seconds per revolution, and Double Density, that's 11.11 milli-seconds per sector, there are 22.21 milli-seconds to get the clock, keyboard and checking routines completed. If the Disk is Single Density, that would be 200 milli-seconds / 10 or 20 milli-seconds per Sector. In that case the Interleave is 1:2, allowing 20 milli-seconds to complete the

System Routines. (Anything else that the Operating System has to do also.) Over all, then it would take 3 Revolutions of the disk to transfer 1 Track. The 5 MEG Hard Disk uses and interleave of 1:12 (1:44 as I will show you.), but the sectors are only .5208 milli-seconds long * 11 sectors = 5.7288 milli-seconds. Whoops, that is not enough time! How about, we add a Blank Rev (32 sectors) in there for 16.6666 milli-seconds, plus the 5.7288 from the interleave for 22.3954 milli-seconds (see, effectively 1:44 when I add the Extra Rev for time). Now that's the ticket, plenty of time! (I will mention here, that some of the new Hard Disk controllers on the new PC's have been able to reach the 1:1 interleave pattern.)

SKEW, now that's another story. As a disk drive ages, the Head Positioning mechanism wears ever so slightly, usually over an extended period of time. What happens then, is that the head isn't quite in the exact same place. This means that the track 'drifts' from it's original position. If the skew is bad enough, the disk drive can no longer read the data properly and a disk error will occur. The disk could be reformatted, and it might be readable again, until the wear again causes reading problems.

A sequential device, like a Tape Drive, also starts from a known location, i.e. the beginning of the tape, and 'reads' the data until the desired 'record' is located. Some methods of decreasing the 'search' time for a tape were developed, including the ability to 'search' for the 'record header' (first record of a 'file') at a high speed. Sometimes, the search could be performed either forward or backward, as required. If a directory (listing of what was on the tape) was the first record, and stored in memory, a request for data access could be checked against the directory, and the tape could be advanced, without having to go back to the beginning and starting over. (Is this clear, so far?) Of course, the time to move the tape is much longer than the time required for the disk.

Now, let's examine the recording media.

MAGNETIC DISK MEDIA

There are some questions as to why anyone would want to stay with the old 5 1/4 inch disk drives, Single or Double Sided, Single or Double Density.

A little background information might help clear the air.

Consider the following:

A magnet has 2 poles, North and South. If a magnet is placed in close proximity to another magnet, or material which can be magnetized, the "MAGNETIC DOMAINS" will have an affect on each other. Additionally, a magnet gradually loses strength over time.

A floppy disk is nothing more than a Plastic Platter with magnetic material impregnated on each side, having concentric rings from the outside to the inside on which information is written. Only about .8 inches is actually used for recording. The density of the recorded material actually varies. (Bull you say) Well, not actually! Consider the proof. The disk drive turns the disk at 300 RPM, but the effective radius is varied. ie, If the head is 2 inches from the center, the circumference is = 2 times PI (3.14159) times 2 (inches from center) which equals a little magnetic "strip" about 12.5660 inches. Now if the HEAD is an inch from the center, the circumference is = 2 times PI (3.14159) times 1 (inch from the center) which equals a little magnetic "strip" about 6.2830 inches, or 1/2 as long. Each of the "strips" contains either 10 (256 bytes each, 2560 bytes total, 20480 bits) sectors (Single Density) or 18 (256 bytes each, 4608 bytes, 36864 bits) sectors (Double Density). This does not include information stored during formatting, and for the header and footer. If included the number of bits is slightly more than doubled. On a 40 track drive the TRACKS are .02 inches apart, twice that of the .01 inch on an 80 track drive. (Tracks are even closer on the newer drives, like 135 tracks per inch on the 3 1/2 versus 48 Tracks Per Inch on a 40 track drive, and 96 tracks per inch on an 80 track drive. Part of each track is reserved as a guard area, so that the domains don't touch, such that only about 70% of the .01 or .02 inch track width is recorded. Of course, a double sided drive has tracks in the same place, but on the other side of the disk as well. (Is this clear so far?)

Now when information is recorded on the disk, the head makes these little "Magnetic

Domains" right next to each other, (interspursed with format information) from both sides (in the same track) and also from adjacent tracks (track #-1 and track #+1) and in the case of double sided, behind this **DOMAIN** also! The higher the density, the smaller the domain. The smaller the domain, the less magnetism can be held, and the quicker the influence of other Magnetic Fields. (Still with me?)

Now, if the disk is recorded on only 1 side, and the tracks are twice as far apart, and the bits on the tracks are almost twice as far apart, the magnetic domain would be 4 times greater, and therefore resist demagnetization longer. (How about Master Disks or Archive Disks) Even at that, Master Disks have to be re-recorded every so often to insure that the information is still readable. That is why the software providers want you to make backup copies. Sooner or later you will be trying to find a good copy of a program that you lost.

MAGNETIC TAPE MEDIA

The Magnetic Tape is a thin layer of base material like polyester, with a coating of magnetic material impregnated on the surface. Like the disk, the Magnetic Domains are recorded as the tape moves across the head. If the Tape is stored for long periods of time, it can develop a distortion of data called PRINT THROUGH, caused by the Magnetic Domains on one layer of tape affecting the Domains on an adjacent layer. (If you have a VCR, sometimes there will be a Ghost image caused by print through. This is similar to the problem that the data tape encounters. Careful adjustment of the recording levels can lower this problem.)

As a SEQUENTIAL storage device, the tape is an excellent method for backing up large capacity disk drives, i.e. Hard Drives. The tape cartridges are used to sequentially load information to or save information from the permanent mass store device. Unfortunately, the cost of the drive is not cheap, and interfaces for all machine types have not been worked out.

I hope that this explanation helps and until next time, HAPPY COMPUTING !
-Ken Strickler

(Editor's Note) Modern disk drives, that is disk drives that are not belt driven such as those original drives installed in the Tandy computers, are driven directly by their motors and are pre-set at the factory for rotation speed, and head alignment. They do not have any adjustments that can be set in the field. Because they are direct drive and preset at the factory they are more reliable than the old belt driven disk drives and rather than try to repair or realign older drives it is a better investment to replace older drives with the new type. Thus giving you not only disk drives that are more reliable, but in most cases you gain in capacity by installing a double-sided 5-1/4 360K or a 3-1/2 720K disk drive. So when that old drive starts giving you trouble don't cheat yourself by having it repaired or realigned, install a new drive with the added capacity and a warranty of a year or more. In fact older style disk drives that fail to read and write properly are out of alignment only about 1% of the time. 99% of the time it is the disk rotation speed, or other mechanical, or electronic circuit problems that cause the trouble.

OPEN FORUM

Q: Does anyone in computer land know how to use SUPER UTILITY PLUS? Everytime I use it all files on disk are ruined. It would be appreciated if someone would try to teach us how to use some of these utility programs.
-D. B. Brent AL

A: Super Utilitiy is a very powerful program and there have been books written about its use beyond what is contained in the manual. One such book now out of print, but you may still be able to find a copy on the used book shelf is "Inside Super Utility Plus" by Paul Wiener orginally published by Breeze Software (PowerSoft).

To use Super Utility Plus beyond simple coping of files from one format to another you need to know how information is stored and retrived from your disks. Proper disk configuration is also needed to read a mystery disk. Super Utility Plus is now owned and distributed by Misosys, and you should address your questions to them, but we would welcome articles from our readers on the more routine aspects of using Super Utility.

FLOW3DBL/BAS Program Listing Number One by Henry H. Herrdegen

```
0  'FLOW3DBL/BAS, reworked for TRSDOS 1.3, paginated, double column printing,
    enhanced & renumbered, by Henry H. Herrdegen, (92 04 28).  92 07 30
1  ' * Flow/Bas * Examines flow of a program *'                    * (credit) **
2  ' * Written for CodeWorks Magazine, 3838 South Warner St.
3  ' * Tacoma, WA 98409 (206)475-2219 voice 475-2356 download
4  ' * (C)1988 80-NW Publishing Inc. Placed in public domain.
5  ' * Suggestion: For max speed, compile this program.
10 CLEAR 1000: CLS: DEFINT A-T: DEFSTR D,F,K,M,S,W: W=CHR$(14)'  * initialize **
11 PRINT W: DIM A(650),B(650),C(650),T(650): F1="##### %     %##### %          %"
12 F2="##### %     %#####": F3="%   % #####": F4="  %   % #####"
13 WF="         FILE: ": WT="GOTO": WS="GOSUB": WC="CONDITIONAL": WL="LINE"
14 DT=MID$(TIME$,7,3)+LEFT$(TIME$,2)+" "+MID$(TIME$,4,2): GOTO 26
15 A=VAL(MID$(F,Q+1,9)): IF A=0 RETURN'            * subroutine to find trailing **
16 J=J+1: Q=INSTR(Q,F,STR$(A))+LEN(STR$(A))-1'* numbers and print the results **
17 IF E1=1 AND E THEN PRINT USING F1; LN;WT;A;WC: A(J)=LN: B(J)=A: C(J)=1: N=N+1
18 IF P AND E1=1 AND E THEN IF R=0 THEN LPRINT "  " USING F1; LN; WT; A; WC ELSE
LPRINT TAB(41) USING F1; LN; WT; A; WC
19 IF E1=1 AND E=0 THEN PRINT USING F2; LN;WT;A: A(J)=LN: B(J)=A: C(J)=2: N=N+1
20 IF P AND E1=1 AND E=0 THEN IF R=0 THEN LPRINT "  " USING F2; LN; WT; A ELSE
LPRINT TAB(41) USING F2; LN; WT; A
21 IF E1=2 AND E THEN PRINT USING F1; LN;WS;A;WC: A(J)=LN: B(J)=A: C(J)=3: N=N+1
22 IF P AND E1=2 AND E THEN IF R=0 THEN LPRINT "  " USING F1; LN; WS; A; WC ELSE
LPRINT TAB(41) USING F1; LN; WS; A; WC
23 IF E1=2 AND E=0 THEN PRINT USING F2; LN;WS;A: A(J)=LN: B(J)=A: C(J)=4: N=N+1
24 IF P AND E1=2 AND E=0 THEN IF R=0 THEN LPRINT "  " USING F2; LN; WS; A ELSE
LPRINT TAB(41) USING F2; LN; WS; A
25 RETURN
26 CLS: PRINT STRING$(24,45) " The CodeWorks " STRING$(24,45)'  * print title **
27 PRINT TAB(11) "P R O G R A M   F L O W   A N A L Y Z E R"
28 PRINT TAB(18) "shows all program branches"
29 PRINT TAB(6) "(for TRSDOS 1.3 and enhanced by Henry H. Herrdegen.)"
30 PRINT STRING$(63,45)
31 PRINT: INPUT "Which (ASCII saved!) file do you wish to examine "; FF
32 PRINT "Do you wish a printer output also ? (Y/N) ";
33 K=INKEY$: IF K="" THEN PRINT W;: GOTO 33 ELSE IF K="Y" OR K="y" THEN P=1
34 CLS: PRINT WF+FF: IF P THEN POKE 16916,1: NP=1: GOSUB 80
35 OPEN"I",1,FF'                                    * Open file and read lines **
36  FOR I=1 TO 650
37   IF EOF(1) THEN CLOSE: C=1: N=N+1: GOTO 82 ELSE LINE INPUT #1, F
38   L=LEN(F)+1: IS=INSTR(F," ")+1: LN=VAL(LEFT$(F,IS))
39   IF MID$(F,IS+1,3)="REM" OR MID$(F,IS+1,1)="'" THEN 45
40    FOR Q=IS TO L: M=M+MID$(F,Q,1): S=RIGHT$(M,4)
41     IF RIGHT$(S,2)="IF" OR RIGHT$(S,2)="ON" THEN E=1
42     IF S="THEN" OR S="ELSE" OR S="GOTO" OR S="SUME" THEN E1=1: GOSUB 15
43     IF S="OSUB" THEN E1=2: GOSUB 15
44    GOSUB 71: NEXT: M="": A=0: E=0: E1=0
45  GOSUB 71: NEXT
46  G=0: FOR I=1 TO J-1: L=I+1: IF C(I)=<C(L) THEN 48'      * sort the arrays **
47    T(I)=C(I): C(I)=C(L): C(L)=T(I): T(I)=A(I): A(I)=A(L): A(L)=T(I): T(I)=B(I)      :B(I)=B(L):B(L)=T(I):
G=1
48  NEXT: IF G THEN 46
49  G=0: FOR I=1 TO J-1: L=I-1'                          * second level sort **
50   IF C(I)<>C(L) OR B(I)=>B(L) THEN 52
51   T(I)=A(I): A(I)=A(L): A(L)=T(I): T(I)=B(I): B(I)=B(L): B(L)=T(I): G=1
52  NEXT: IF G THEN 49
53  FOR I=1 TO J: L=I-1'                               * consolidate routine **
54   IF B(I)=B(L) THEN EQ=1 ELSE EQ=0
```

```
55   IF EQ=0 THEN GOSUB 71
56   ON C(I) GOTO 57,58,59,60
57   D="Cond GOTO ": GOTO 61
58   D="Hard GOTO ": GOTO 61
59   D="Cond GOSUB": GOTO 61
60   D="Hard GOSUB"
61   IF EQ=0 THEN LA=0: GOTO 65 ELSE LA=LA+LEN(STR$(A(I)))+1
62   IF P AND LA=>72 THEN N=N+1: LPRINT: LPRINT "  ";: LA=2
63   IF P=0 AND LA=>58 THEN N=N+1: LA=1
64   IF EQ THEN PRINT A(I);: IF P=0 THEN 69 ELSE 67
65   PRINT: PRINT USING F3; WL; B(I);: PRINT " is a " D " called from:" A(I);
66   LA=39+LEN(STR$(A(I)))+1: N=N+1: IF P=0 THEN 69
67   IF EQ THEN LPRINT A(I);: GOTO 69
68   LPRINT: LPRINT USING F4; WL; B(I);: LPRINT " is a " D " called from:" A(I);
69  NEXT
70 PRINT: PRINT "DONE": POKE 16916,0: IF P THEN LPRINT: LPRINT: LPRINT "  DONE."   : END ELSE
END
71 IF P THEN 74 ELSE IF N<12 RETURN'                    * pagination subroutines **
72 PRINT "     press <SPACE BAR> to continue . . . ";
73 K=INKEY$: IF K<>" " THEN 73 ELSE CLS: N=0: PRINT WF+FF: RETURN
74 IF C THEN 76 ELSE IF R=0 THEN IF N<54 RETURN ELSE R=1: FOR T=1 TO 110:
LPRINT CHR$(27) CHR$(30);: NEXT: N=0: LPRINT: RETURN
75 IF R THEN IF N<54 RETURN ELSE GOSUB 78: R=0: RETURN
76 IF R THEN LPRINT STRING$(54-N,10): N=54: GOSUB 78: GOTO 46
77 IF N<54 RETURN ELSE GOSUB 78: RETURN
78 LPRINT: LPRINT TAB(65) "continued:": R=0
79 LPRINT STRING$(7-(N-54),10): NP=NP+1: N=0
80 LPRINT TAB(8) "Program flow of: " FF TAB(60) DT ",   PG.:" NP
81 IF C RETURN ELSE LPRINT: RETURN
82 PRINT "  sorting . . ";: IF C THEN IF P AND N>50 THEN LPRINT STRING$(54-N,10)    : N=54:
GOSUB 78: GOTO 46 ELSE IF R THEN 76 ELSE 46
```

FLOW4DBL/BAS Program Listing Number One by Henry H. Herrdegen

```
0  'FLOW4DBL/BAS, reworked for LS-DOS 6.3, paginated, double column printing,
    enhanced & renumbered, by Henry H. Herrdegen, (92 04 28).  92 07 30
1  ' * Flow/Bas * Examines flow of a program *'                  * (credit) **
2  ' * Written for CodeWorks Magazine, 3838 South Warner St.
3  ' * Tacoma, WA 98409 (206)475-2219 voice 475-2356 download
4  ' * (C)1988 80-NW Publishing Inc. Placed in public domain.
5  ' * Suggestion: For max speed, compile this program.
10 CLEAR: CLS: DEFINT A-T: DEFSTR D,F,K,M,S,W'                      * initialize **
11 DIM A(650),B(650),C(650): F1="##### \     \##### \           \"
12 F2="##### \     \#####": F3="\  \ #####": F4="  \  \ #####"
13 WF="          FILE: ": WT="GOTO": WS="GOSUB": WC="CONDITIONAL": WL="LINE"
14 DT=RIGHT$(DATE$,2)+" "+LEFT$(DATE$,2)+" "+MID$(DATE$,4,2): GOTO 26
15 A=VAL(MID$(F,Q+1,9)): IF A=0 THEN RETURN'    * subroutine to find trailing **
16 J=J+1: Q=INSTR(Q,F,STR$(A))+LEN(STR$(A))-1'* numbers and print the results **
17 IF E1=1 AND E THEN PRINT USING F1; LN;WT;A;WC: A(J)=LN: B(J)=A: C(J)=1: N=N+1
18 IF P AND E1=1 AND E THEN IF R=0 THEN LPRINT "  " USING F1; LN; WT; A; WC ELSE
LPRINT TAB(41) USING F1; LN; WT; A; WC
19 IF E1=1 AND E=0 THEN PRINT USING F2; LN;WT;A: A(J)=LN: B(J)=A: C(J)=2: N=N+1
20 IF P AND E1=1 AND E=0 THEN IF R=0 THEN LPRINT "  " USING F2; LN; WT; A ELSE
LPRINT TAB(41) USING F2; LN; WT; A
21 IF E1=2 AND E THEN PRINT USING F1; LN;WS;A;WC: A(J)=LN: B(J)=A: C(J)=3: N=N+1
22 IF P AND E1=2 AND E THEN IF R=0 THEN LPRINT "  " USING F1; LN; WS; A; WC ELSE
LPRINT TAB(41) USING F1; LN; WS; A; WC
23 IF E1=2 AND E=0 THEN PRINT USING F2; LN;WS;A: A(J)=LN: B(J)=A: C(J)=4: N=N+1
24 IF P AND E1=2 AND E=0 THEN IF R=0 THEN LPRINT "  " USING F2; LN; WS; A ELSE
```

```
LPRINT TAB(41) USING F2; LN; WS; A
25 RETURN
26 CLS: PRINT STRING$(32,45) " The CodeWorks " STRING$(33,45);' * print title **
27 PRINT TAB(21) "P R O G R A M   F L O W   A N A L Y Z E R"
28 PRINT TAB(28) "shows all program branches"
29 PRINT TAB(15) "(for LS-DOS 6.3 and enhanced by Henry H. Herrdegen.)"
30 PRINT STRING$(80,45);
31 PRINT: INPUT "   Which (ASCII saved!) file do you wish to examine "; FF
32 PRINT "   Do you wish a printer output also ? (Y/N) ";
33 K=INKEY$: IF K="" THEN 33 ELSE IF K="Y" OR K="y" THEN P=1
34 CLS: PRINT WF+FF: IF P THEN POKE 2964,1: NP=1: GOSUB 80
35 OPEN"I",1,FF'                              * Open file and read lines **
36  FOR I=1 TO 650
37   IF EOF(1) THEN CLOSE: C=1: N=N+1: GOTO 82 ELSE LINE INPUT #1, F
38   L=LEN(F)+1: IS=INSTR(F," ")+1: LN=VAL(LEFT$(F,IS))
39   IF MID$(F,IS+1,3)="REM" OR MID$(F,IS+1,1)="'" THEN 45
40    FOR Q=IS TO L: M=M+MID$(F,Q,1): S=RIGHT$(M,4)
41     IF RIGHT$(S,2)="IF" OR RIGHT$(S,2)="ON" THEN E=1
42     IF S="THEN" OR S="ELSE" OR S="GOTO" OR S="SUME" THEN E1=1: GOSUB 15
43     IF S="OSUB" THEN E1=2: GOSUB 15
44    GOSUB 71: NEXT: M="": A=0: E=0: E1=0
45  GOSUB 71: NEXT
46  G=0: FOR I=1 TO J-1: L=I+1: IF C(I)=<C(L) THEN 48'      * sort the arrays **
47   SWAP C(I),C(L): SWAP A(I),A(L): SWAP B(I),B(L): G=1
48  NEXT: IF G THEN 46
49  G=0: FOR I=1 TO J-1: L=I-1'                         * second level sort **
50   IF C(I)<>C(L) OR B(I)=>B(L) THEN 52
51   SWAP A(I),A(L): SWAP B(I),B(L): G=1
52  NEXT: IF G THEN 49
53  FOR I=1 TO J: L=I-1'                                * consolidate routine **
54   IF B(I)=B(L) THEN EQ=1 ELSE EQ=0
55   IF EQ=0 THEN GOSUB 71
56   ON C(I) GOTO 57,58,59,60
57   D="Cond GOTO ": GOTO 61
58   D="Hard GOTO ": GOTO 61
59   D="Cond GOSUB": GOTO 61
60   D="Hard GOSUB"
61   IF EQ=0 THEN LA=0: GOTO 65 ELSE LA=LA+LEN(STR$(A(I)))+1
62   IF LA=>72 THEN N=N+1: PRINT: LA=1: IF P THEN LPRINT: LPRINT "  ";: LA=2
64   IF EQ THEN PRINT A(I);: IF P=0 THEN 69 ELSE 67
65   PRINT: PRINT USING F3; WL; B(I);: PRINT " is a " D " called from:" A(I);
66   LA=39+LEN(STR$(A(I)))+1: N=N+1: IF P=0 THEN 69
67   IF EQ THEN LPRINT A(I);: GOTO 69
68   LPRINT: LPRINT USING F4; WL; B(I);: LPRINT " is a " D " called from:" A(I);
69  NEXT
70 PRINT: PRINT "DONE": POKE 2964,0: IF P THEN LPRINT: LPRINT: LPRINT "  DONE.":   END ELSE
END
71 IF P THEN 74 ELSE IF N<20 THEN RETURN'              * pagination subroutines **
72 PRINT "     press <SPACE BAR> to continue . . . ";: SOUND 0,0
73 K=INKEY$: IF K<>" " THEN 73 ELSE CLS: N=0: PRINT WF+FF: RETURN
74 IF C THEN 76 ELSE IF R=0 THEN IF N<54 THEN RETURN ELSE R=1: FOR T=1 TO N+1:
LPRINT CHR$(27) CHR$(10);: NEXT: N=0: RETURN
75 IF R THEN IF N<54 THEN RETURN ELSE GOSUB 78: R=0: RETURN
76 IF R THEN LPRINT STRING$(54-N,10): N=54: GOSUB 78: GOTO 46
77 IF N<54 THEN RETURN ELSE GOSUB 78: RETURN
78 LPRINT: LPRINT TAB(65) "continued:": R=0
79 LPRINT STRING$(7-(N-54),10): NP=NP+1: N=0
80 LPRINT TAB(8) "Program flow of: " FF TAB(60) DT ",   PG.:" NP
```

```
81 IF C THEN RETURN ELSE LPRINT: RETURN
82 PRINT "  sorting . . ";: IF C THEN IF P AND N>50 THEN LPRINT STRING$(54-N,10)    : N=54:
GOSUB 78: GOTO 46 ELSE IF R THEN 76 ELSE 46
```

PUTSEQ/PRO Program Listing Number Three by Robert Knowles

```
10 'PUTSEQ/PRO
20 CLS
30 OPEN "O",1,"FONE0000/SEQ:1"
40 PRINT"USE / IN THE DATE $ and . IN AMOUNT BUT NO OTHER PUNCTUATION MARKS."
50 PRINT"CHECK                BILLING            AMOUNT              DATE"
60 PRINT"NUMBER               PERIOD              PAID               PAID"
70 LINE INPUT;N$
80 IF N$="DONE" THEN 110
90 WRITE# 1,N$
100 GOTO 70
110 CLOSE 1
```

ADDRLST/BAS Program Listing Number Four by Robert Knowles

```
10 CLS
20 LPRINT:LPRINT:LPRINT
30 LPRINT TAB(34);"ADDRESS LIST"
40 LPRINT
50 LPRINT TAB(9)"CUSTOMER ADDRESS";:LPRINT TAB(55)"CUSTOMER ADDRESS"
60 LPRINT
70 PRINT
80 INPUT"NAME";A$
90 INPUT"ADDRESS";B$
100 INPUT"CITY,STATE AND ZIP";C$
110 INPUT"PHONE NUMBER";D$
120 PRINT
130 INPUT"NAME";E$
140 INPUT"ADDRESS";F$
150 INPUT"CITY,STATE AND ZIP";G$
160 INPUT"PHONE NUMBER";H$
170 LPRINT TAB(9);A$;TAB(55);B$
180 LPRINT TAB(9);B$;TAB(55);F$
190 LPRINT TAB(9);C$;TAB(55);G$
200 LPRINT TAB(9);D$;TAB(55);H$
210 LPRINT
220 GOTO 70
```

BIORHYT4/BAS Program Listing Number Five by Henry H. Herrdegen

```
0 'BIORHYT4: revamped BIO/BAS for Model 4, LS-DOS 6.3: corrected syntax and moon   phase,
condensed and renumbered. Henry H. Herrdegen, (92 05 10),  92 07 11
1  REM * Bio.Bas * Biorhythm program. CodeWorks Magazine'         ** (credit) **
2  REM * 3838 S. Warner St. Tacoma, WA 98409
3  REM * (206) 475-2219 voice, (206) 475-2356 300/1200 modem
4  REM * (C)1988 80-NW Publishing Inc and placed in public domain
10 DEFSTR A,B,I,N,V: DIM M$(12): VF=CHR$(15): VN=CHR$(14)'        ** INITIATE **
11 DEF FNE(M)=(M-2*INT(M/2)=0)'                           ** define function even **
12 DEF FNO(M)=NOT FNE(M)'                                  ** define function odd **
13 DEF FNDA(M)=30+(M<8)*FNO(M)+(M>7)*FNE(M)+2*(M=2)'  ** define function D/M **
14 PI=3.14159: PI=PI*2: MP=29.5574'    ** set constants (MP=av. moon period) **
15 DATA Sun,Mon,Tue,Wed,Thu,Fri,Sat
16 DATA Jan,Feb,Mar,Apr,May,Jun,Jul,Aug,Sep,Oct,Nov,Dec
19  FOR J=1 TO 7: READ D$(J): NEXT: FOR J=1 TO 12: READ M$(J): NEXT: GOTO 37
22 I=INKEY$: IF I="" THEN 22 ELSE H=ASC(I)'                   ** SUBROUTINES **
23 IF H>96 AND H<123 THEN I=CHR$(H-32): RETURN ELSE RETURN
```

```
24 IF M<3 THEN K=1 ELSE K=0'                              ** find day of week **
25 L=Y-K: Q=M+12*K: P=L/100: Z1=INT(P/4): Z2=INT(P): Z3=INT((5*L)/4)
26 Z4=INT(13*(Q+1)/5): Z=Z4+Z3-Z2+Z1+D-1: Z=Z-(7*INT(Z/7))+1: D1$=STR$(D)
27 IF LEN(D1$)=2 THEN D1$=" "+D1$: RETURN ELSE RETURN
28 D1=(Y*365)+D: L=M: M1=M: IF M<=2 THEN 30'          ** total days calculator **
29 L=(L*.4)+2.3: L=INT(L): D1=D1-L: Y=Y+1
30 M=((M*31)+(Y-1)/4): M=INT(M): D1=D1+M: IF Y=1900 THEN D1=D1+1
31 M=M1: IF M>2 THEN Y=Y-1: RETURN ELSE RETURN
32 PRINT VN "  press <SPACE BAR> to continue ";: R=0'            ** pagination **
33 GOSUB 22: IF I<>" " THEN 33 ELSE POKE 2964,2: PRINT @1840, VF;: RETURN
34 LPRINT TAB(10) "Biorhythm Chart for " N ",   (cont'd:)": RP=0: LPRINT: LPRINT
35 LPRINT: LPRINT TAB(10)"-"TAB(26) "0" TAB(41)"+"TAB(49) "Index:  Age:   Date:"
36 LPRINT: LPRINT STRING$(78,45): LPRINT: RETURN
37 CLS: PRINT STRING$(32,45);" The CodeWorks ";STRING$(32,45)'    ** MAIN PGM **
38 PRINT TAB(24) "B I O R H Y T H M   P R O G R A M"
39 PRINT TAB(26) "plot your personal biorhythms"
40 PRINT TAB(10) "(adapted for LS-DOS 6.3 and enhanced by Henry H. Herrdegen.)"
41 PRINT STRING$(79,45): PRINT
42 PRINT "Do you want printed output too (Y/N) ? ";
43 GOSUB 22: IF I="Y" THEN PR=1: PRINT I ELSE IF I<>"N" THEN 43 ELSE PRINT I
44 LINE INPUT "Please enter your name: "; N
45 INPUT "now  enter  your  birthdate,  (MM,DD,YYYY): ", M,D,Y
46 B="(born:"+STR$(M)+STR$(D)+STR$(Y)+")": GOSUB 28
47 K1=D1: INPUT "enter date to start the chart (MM,DD,YYYY): ", M,D,Y
48 GOSUB 24: GOSUB 28'            ** get initial day of week, then total days **
49 T=D1-K1:T=ABS(T)'                                  ** T holds total days lived **
50 GOSUB 28: T1=D1-686705!'                        ** T1 holds days of moon phase **
51 IF PR THEN PRINT "Turn on your printer and align the paper." ELSE 53
52 PRINT "(50 days will fit on a standard sheet. Default, press <ENTER>)
53 INPUT "How many days do you want to chart ? ", CP: IF CP=0 AND PR=0 THEN 53
54 IF PR AND CP=0 THEN CP=50: PRINT TAB(37) CHR$(11) CP
55 PRINT: PRINT TAB(10) "Biorhythm Chart for " N ",  " B:'    ** print chart **
56 PRINT VF: PRINT "  p is the 23-day physical cycle"
57 PRINT "  e is the 28-day emotional cycle"
58 PRINT "  i is the 33-day intellectual cycle"
59 PRINT "  . is the phase of the moon (max + is the 1st Qtr.)": PRINT
61 PRINT TAB(10) "-" TAB(26) "0" TAB(41) "+" TAB(49) "Index:  Age:   Date:"
62 IF PR THEN LPRINT TAB(10) "Biorhythm Chart for " N ",  " B: LPRINT ELSE 68
63 LPRINT "  p is the 23-day physical cycle
64 LPRINT "  e is the 28-day emotional cycle"
65 LPRINT "  i is the 33-day intellectual cycle"
66 LPRINT "  . is the phase of the moon (max + is the 1st Qtr.)"
67 LPRINT TAB(10) "-" TAB(26) "0" TAB(41) "+" TAB(49) "Index:  Age:   Date:"
68 PRINT STRING$(78,45): IF PR THEN LPRINT STRING$(78,45)
69 A=STRING$(52,32): CT=0'                              ** A STRING PRINT LOOP **
70 T$=STRING$(6-LEN(STR$(T))," ")+STR$(T)'         ** right justify age numbers **
71 F=(T/33)-INT(T/33): X=F*PI'        ** find position of intellectual symbol **
72 P=((SIN(X)+1)*24)+2: P1=(P*10)/50: IF P1>4.5 AND P1<5.5 THEN P1=0
73 MID$(A,25,3)=": :": MID$(A,P,1)= "i"
74 F=(T/28)-INT(T/28): X=F*PI'            ** find position of emotional symbol **
75 P=((SIN(X)+1)*22)+4: P2=(P*10)/50: IF P2>4.5 AND P2<5.5 THEN P2=0
76 MID$(A,P,1)= "e"
77 F=(T/23)-INT(T/23): X=F*PI'             ** find position of physical symbol **
78 P=((SIN(X)+1)*20)+6: P3=(P*10)/50: IF P3>4.5 AND P3<5.5 THEN P3=0
79 MID$(A,P,1)= "p"
80 F=(T1/MP)-INT(T1/MP): X=F*PI'         ** find position of the moon symbol **
81 P=((SIN(X)+1)*24)+2: MID$(A,P,1)= "."
82 SC=((P1*.5)+P2+P3)/2.5: SC=INT(SC+.5): SU=SU+SC
```

```
83 '                  ** fill A string with all the reminder of the information **
84 A=A+STR$(SC)+" "+T$+"  "+D$(Z)+" "+ M$(M)+D1$+STR$(Y)
86 IF PR THEN LPRINT A: PRINT A: RP=RP+1 ELSE PRINT A: R=R+1
87 A=STRING$(52,32): SC=0: IF R=21 THEN GOSUB 32'           ** clear A string **
89 IF CP>50 THEN IF RP=50 THEN LPRINT STRING$(7,10): GOSUB 34
90 D2=FNDA(M)'                               ** increment the date for next day **
91 IF M=2 AND (NOT Y=1900) AND (Y-4*INT(Y/4)=0) THEN D2=D2+1
92 D=D+1: IF D>D2 THEN D=1:M=M+1
93 IF M>12 THEN Y=Y+1: M=1
94 GOSUB 24'                             ** to find day of week for the new day **
95 GOSUB 28: T1=D1-686705!'                           ** update the moon phase **
96 T=T+1'                                    ** increment the days lived count **
97 CT=CT+1: IF CT<CP THEN 70 ELSE PRINT "Average index for this period is "SU/CP
98 IF PR THEN LPRINT: LPRINT "Average index for this period is "SU/CP: LPRINT
99 POKE 2964,0: END
```

BIORHYT3/BAS Program Listing Number Six by Henry H. Herrdegen

```
0 'BIORHYT3: revamped BIO/BAS for Model III TRSDOS 1.3. Corrected screen print,     syntax and
moon phase, added pagination, condensed and renumbered.               By Henry H. Herrdegen, (92
05 15). 92 07 11
1  REM * Bio.Bas * Biorhythm program. CodeWorks Magazine'         ** (credit) **
2  REM * 3838 S. Warner St. Tacoma, WA 98409
3  REM * (206) 475-2219 voice, (206) 475-2356 300/1200 modem
4  REM * (C)1988 80-NW Publishing Inc and placed in public domain
10 CLEAR 2000: DEFSTR A,B,I,N: DIM M$(12), MS$(12)'            ** INITIATE **
11 DEF FNE(M)=(M-2*INT(M/2)=0)'                        ** define function even **
12 DEF FNO(M)=NOT FNE(M)'                               ** define function odd **
13 DEF FNDA(M)=30+(M<8)*FNO(M)+(M>7)*FNE(M)+2*(M=2)'  ** define function D/M **
14 PI=3.14159: PI=PI*2: MP=29.5574'    ** set constants (MP=av. moon period) **
15 DATA Sun,Mon,Tue,Wed,Thu,Fri,Sat
16 DATA Jan,Feb,Mar,Apr,May,Jun,Jul,Aug,Sep,Oct,Nov,Dec
17 DATA Su,Mo,Tu,We,Th,Fr,Sa
18 DATA .1,2,3,4,5,6,7,8,9,10,11,12
19  FOR J=1 TO 7: READ D$(J): NEXT: FOR J=1 TO 12: READ M$(J): NEXT
20  FOR J=1 TO 7: READ DS$(J): NEXT: FOR J=1 TO 12: READ MS$(J)
21  IF LEN(MS$(J))=1 THEN MS$(J)=" "+MS$(J): NEXT ELSE NEXT: GOTO 37
22 I=INKEY$: IF I="" THEN 22 ELSE H=ASC(I)'                  ** SUBROUTINES **
23 IF H>96 AND H<123 THEN I=CHR$(H-32): RETURN ELSE RETURN
24 IF M<3 THEN K=1 ELSE K=0'                             ** find day of week **
25 L=Y-K: Q=M+12*K: P=L/100: Z1=INT(P/4): Z2=INT(P): Z3=INT((5*L)/4)
26 Z4=INT(13*(Q+1)/5): Z=Z4+Z3-Z2+Z1+D-1: Z=Z-(7*INT(Z/7))+1: D1$=STR$(D)
27 IF LEN(D1$)=2 THEN D1$=" "+D1$: RETURN ELSE RETURN
28 D1=(Y*365)+D: L=M: M1=M: IF M<=2 THEN 30'        ** total days calculator **
29 L=(L*.4)+2.3: L=INT(L): D1=D1-L: Y=Y+1
30 M=((M*31)+(Y-1)/4): M=INT(M): D1=D1+M: IF Y=1900 THEN D1=D1+1
31 M=M1: IF M>2 THEN Y=Y-1: RETURN ELSE RETURN
32 R=0: PRINT "  press <SPACE BAR> to continue ";'           **  pagination **
33 GOSUB 22: IF I<>" " THEN 33 ELSE POKE 16916,1: PRINT @960,;: RETURN
34 LPRINT TAB(10) "Biorhythm Chart for " N ",   (cont'd:)": RP=0: LPRINT: LPRINT
35 LPRINT: LPRINT TAB(9) "-" TAB(25) "0" TAB(40) "+" TAB(48) "Index:  Age:   Date:"
36 LPRINT: LPRINT STRING$(78,45): LPRINT: RETURN
37 CLS: PRINT STRING$(24,45) " The CodeWorks " STRING$(24,45)'   ** MAIN PGM **
38 PRINT TAB(15) "B I O R H Y T H M   P R O G R A M"
39 PRINT TAB(17) "plot your personal biorhythms"
40 PRINT "  (adapted for TRSDOS 1.3 and enhanced by Henry H. Herrdegen.)"
41 PRINT STRING$(63,45): PRINT
42 PRINT "Do you want printed output too (Y/N) ? ";
43 GOSUB 22: IF I="Y" THEN PR=1: PRINT I ELSE IF I<>"N" THEN 43 ELSE PRINT I
```

```
44 LINE INPUT "Please enter your name: "; N
45 INPUT "now  enter  your  birthdate,  (MM,DD,YYYY) "; M,D,Y: GOSUB 28
46 B="(born:"+STR$(M)+STR$(D)+STR$(Y)+")": GOSUB 28
47 K1=D1: INPUT "enter date to start the chart (MM,DD,YYYY) "; M,D,Y
48 GOSUB 24: GOSUB 28'            ** get initial day of week, then total days **
49 T=D1-K1:T=ABS(T)'                                ** T holds total days lived **
50 GOSUB 28: T1=D1-686705!'                     ** T1 holds days of moon phase **
51 IF PR THEN PRINT "Turn on your printer and align the paper." ELSE 53
52 PRINT "(50 days will fit on a standard sheet. Default, press <ENTER>)
53 INPUT "How many days do you want to chart "; CP: IF CP=0 AND PR=0 THEN 53
54 IF PR THEN IF CP=0 THEN CP=50: PRINT TAB(37) CHR$(27) CP
55 PRINT: PRINT "      Biorhythm Chart for " N ",  " B'         ** print chart **
56 PRINT: PRINT "  p is the 23-day physical cycle"
57 PRINT "  e is the 28-day emotional cycle"
58 PRINT "  i is the 33-day intellectual cycle"
59 PRINT "  . is the phase of the moon (max + is the 1st Qtr.)": PRINT
60 IF PR THEN PRINT "    printing hardcopy . . .": PRINT CHR$(27);: GOTO 62
61 PRINT TAB(14) "-" TAB(25) "O" TAB(36) "+" TAB(45) "Index: Date:": GOTO 69
62 LPRINT TAB(10) "Biorhythm Chart for " N ",  " B: LPRINT
63 LPRINT "  p is the 23-day physical cycle
64 LPRINT "  e is the 28-day emotional cycle"
65 LPRINT "  i is the 33-day intellectual cycle"
66 LPRINT "  . is the phase of the moon (max + is the 1st Qtr.)"
67 LPRINT TAB(9) "-" TAB(25) "0" TAB(40) "+" TAB(48) "Index:  Age:   Date:"
68 LPRINT STRING$(78,45): A=STRING$(52,32): CT=0: GOTO 70
69 A=STRING$(49,32): CT=0'                              ** A STRING PRINT LOOP **
70 T$=STRING$(6-LEN(STR$(T))," ")+STR$(T)'      ** right justify age numbers **
71 F=(T/33)-INT(T/33): X=F*PI'        ** find position of intellectual symbol **
72 P=((SIN(X)+1)*24)+2: P1=(P*10)/50: IF P1>4.5 AND P1<5.5 THEN P1=0
73 MID$(A,25,3)=": :": MID$(A,P,1)= "i"
74 F=(T/28)-INT(T/28): X=F*PI'            ** find position of emotional symbol **
75 P=((SIN(X)+1)*22)+4: P2=(P*10)/50: IF P2>4.5 AND P2<5.5 THEN P2=0
76 MID$(A,P,1)= "e"
77 F=(T/23)-INT(T/23): X=F*PI'             ** find position of physical symbol **
78 P=((SIN(X)+1)*20)+6: P3=(P*10)/50: IF P3>4.5 AND P3<5.5 THEN P3=0
79 MID$(A,P,1)= "p"
80 F=(T1/MP)-INT(T1/MP): X=F*PI'          ** find position of the moon symbol **
81 P=((SIN(X)+1)*24)+2: MID$(A,P,1)= "."
82 SC=((P1*.5)+P2+P3)/2.5: SC=INT(SC+.5): SU=SU+SC
83 '                ** fill A string with all the reminder of the information **
84 IF PR THEN A=A+STR$(SC)+" "+T$+"  "+D$(Z)+" "+M$(M)+D1$+STR$(Y): GOTO 86
85 A=A+STR$(SC)+" "+DS$(Z)+" "+MS$(M)+D1$+" "+RIGHT$(STR$(Y),2)
86 IF PR THEN LPRINT A: RP=RP+1 ELSE PRINT A: R=R+1
87 IF PR THEN A=STRING$(52,32): SC=0: GOTO 89'              ** clear A string **
88 A=STRING$(49,32): SC=0: IF R=14 GOSUB 32
89 IF CP>50 THEN IF RP=50 THEN LPRINT STRING$(7,10): GOSUB 34
90 D2=FNDA(M)'                               ** increment the date for next day **
91 IF M=2 AND (NOT Y=1900) AND (Y-4*INT(Y/4)=0) THEN D2=D2+1
92 D=D+1: IF D>D2 THEN D=1:M=M+1
93 IF M>12 THEN Y=Y+1: M=1
94 GOSUB 24'                             ** to find day of week for the new day **
95 GOSUB 28: T1=D1-686705!'                              ** update the moon phase **
96 T=T+1'                                     ** increment the days lived count **
97 CT=CT+1: IF CT<CP THEN 70 ELSE PRINT "Average index for this period is "SU/CP
98 IF PR THEN LPRINT: LPRINT "Average index for this period is "SU/CP: LPRINT
99 POKE 16916,0: END
```

Computer News 80

REPAIR AND UPGRADE SERVICE FOR MODELS III, 4, 4P AND 4D

- * UPGRADE INSTALLATIONS
- * MEMORY EXPANSION TO 128K
- * HIGH RESOLUTION BOARDS
- * RS232 COMMUNICATION BOARDS
- * DOUBLE SIDED DISK DRIVES
- * OTHER UPGRADES AVAILABLEO

We give you a firm quotation on all work to be done prior to doing the work. If you do not approve your computer is returned to you. A small diagnostic fee and return shipping costs will be charged.

You supply your own shipping carton and ship the computer to us for repair, via United Parcel Service. Please remember to insure your shipment. Return packaging and shipping costs will be included in our quotation for any repairs or installation charges.

For more details call
307-265-6483

Our shipping address is:
Computer News 80
1220 Jamaica Drive
Casper, WY 82609

RESTORATION SERVICE

If you have an original application program disk that needs to be restored, send it and $5.00 to cover the postage and handling. Please remember that it must be an original, legally owned by you, master disk. We will not restore copies of original program disks. There are many commercial games and other programs that we will not have in the archives, so it is best to call first and check.

FILE TRANSFER SERVICE

If you want to have your files transferred from one media to another. Such as having your files transferred from 5-1/4 disks to 3-1/2 we can do that for you. If you want to have files transferred from an IBM (MS-DOS) format to a TRSDOS/LS-DOS format, or from TRS-80 to IBM (MS-DOS) we can provide that service. However we do not have the equipment to handle 8" disks. Call or write for further details concerning the transfer service.

CP/M

Now only $140. Pickles & Trout CP/M-2.2m for your Radio Shack TRS-80 Model-II, -12, -16, or -6000 computer.

Still running"“less-than-the-best?” We can upgrade your existing CP/M software (Lifeboat, P&T, ATON, Whatever) to the latest Pickles & Trout CP/M-2.2mH release, only $65. [Includes new manuals, full screen editor, full utilities, double sided disk support, and more.]

RAMD — Let your P&T CP/M use the 68000, memory as a super-speed disk drive, only $49.

REFORMATTER — Your TRSDOS system can read/write CP/M diskettes, only $49.

Looking for a CP/M program? WordStar, dBASE?
Give us a call.

TriSoft
1825 East 38 1/2
Austin, TX 78722
1-800-531-5170
1-512-472-0744

MOUSEDOS

by Leonard Lorden

Load MOUSEDOS (Mouse Plus by David Goben is required) and select an icon from the screen display. Disk Drive Icon, displays a new menu and mini-keyboard. Write your command line. Utility Icon, displays several DOS commands and utility icons, click the mouse on the desired command icon or click the Exit icon to return to the main menu.

Included are icons for AUTO, BACKUP, BOOT, CONV, COPY, FILTER, FORMAT, FORMS, LINK, LIST, REMOVE, RENAME, RESET, ROUTE, SET, SETKI, SPOOL, SYSTEM, VERIFY.

Fancy in appearance, easy to understand and use. A must for mouse users. $ 25 plus S&H

TOP QUALITY PRINTER RIBBONS

Printer	Radio Shack Cat. Number	CN80 Number	Type	Price Each for	
				One	6 or More
LP I, II, IV	26-1413	CN1001	FABRIC REFILL	5.55	5.05
LP III, V	26-1414	CN1002	FABRIC CART.	6.38	5.88
LP III, V	26-1414	CN1003	FABRIC REFILL	4.79	4.29
LP VI/VIII,DMP 400/420	26-1418	CN1004	FABRIC CART.	5.60	5.10
LP VII, DMP 100	26-1424	CN1038	FABRIC CART.	6.00	4.50
DMP 110	26-1283	CN1005	FABRIC CART.	6.58	6.08
DMP130/130A/132/133/107	26-1236	CN1006	FABRIC CART.	6.40	5.90
DMP130/130A/132/133/107	26-1238	CN1007	FABRIC REFILL	5.00	4.50
DMP 500	26-1482	CN1008	FABRIC CART.	13.40	12.90
DMP 120, 200	26-1483	CN1009	FABRIC CART.	7.00	6.50
DMP 120, 200	26-1489	CN1010	FABRIC REFILL	4.85	4.35
DMP 430	26-1296	CN1013	FABRIC CART.	12.25	11.75
DMP 440	26-2809	CN1014	FABRIC CART.	19.30	18.80
DMP 2100, 2100P, 2110	26-1442	CN1015	FABRIC CART.	6.10	5.60
DMP 2100, 2100P, 2110	26-1442	CN1016	FABRIC REFILL	4.85	4.35
DMP 2120	26-2834	CN1017	FABRIC CART.	13.05	13.05
DMP 2120	26-2836	CN1018	FABRIC REFILL	7.90	7.40
LMP 2150	26-1287	CN1019	FABRIC CART.	8.00	7.50
DWP II, DWP 410/510	26-1419	CN1020	MULTI-STRIKE CT.	5.35	4.85
DWP II, DWP 410/510	26-1419	CN1021	M-S REFILL	4.50	4.00
DWP II, DWP 410/510	26-1449	CN1022	FABRIC CART.	6.55	5.95
DWP II, DWP 410/510	26-1449	CN1023	FABRIC REFILL	5.45	4.95
DWP 520, 230, 210	26-1445	CN1024	MULTI-STRIKE CT.	5.15	4.65
DWP 520, 230, 210	26-1445	CN1025	M-S REFILL	4.50	4.00
DWP 520, 230, 210	26-1458	CN1026	FABRIC CART.	5.60	5.10
DWP 520, 230, 210	26-1458	CN1027	FABRIC REFILL	4.80	4.30
DWP 220	26-1299	CN1028	MULTI-STRIKE CT.	7.95	7.45
DWP 220	26-1299	CN1029	M-S REFILL	3.60	3.10
DMP 300/2102	26-2819	CN1030	FABRIC CART.	7.15	6.65
DMP 300/2102	26-2819	CN1031	LONG LIFE CART.	6.85	6.35
ALPS ASP-1000	900-2326	CN1032	FABRIC CART.	6.60	6.10
EPSON FX/MX/RX-80	900-2327	CN1033	FABRIC CART.	5.50	5.00
EPSON LX/80/90	900-2328	CN1034	FABRIC CART.	5.00	4.50
PANASONIC KXP1090	900-2331	CN1035	FABRIC CART.	6.10	5.60
PANASONIC KXP1090	900-2331	CN1036	LONG LIFE CART.	7.35	6.85
STAR MICRON. NX1000	900-2332	CN1037	FABRIC CART.	6.45	5.95
PANASONIC KXP1180/1190/1191		CN1039	FABRIC CART.	6.90	6.40
PANASONIC KXP1180/1190/1191		CN1040	LONG LIFE CART.	7.60	7.10
SEIKOSHA SP-2000		CN1041	FABRIC CART.	6.40	5.90
DMP 500		CN1043	FABRIC REFILL	5.30	4.80
DMP 430		CN1044	FABRIC REFILL	5.60	5.10
ALPS ALLEGRO 24		CN1045	FABRIC CART.	7.25	6.75

ALL RIBBONS ARE BLACK, CART.= Plastic Cartridge, REFILL= Refills Only/No Cartridge.

Add for Shipping and Handling

1 to five items add (Y) .... 6 or more items add (Z)
Please refer to the CN80 Product Guide Shipping and Handling Schedule.

Some ribbons for the older Radio Shack printers are not stocked, but are still available by special order, please allow an additional week shipping time. All stock ribbons are shipped within 24 hours from the time the order is received. C.O.D orders accepted. Government and educational institution purchase orders are accepted. Sorry, we do not accept credit card orders.

Computer News 80 Product Guide

BACK ISSUES, INDEX, & REPRINTS

CN80 BACK ISSUES Individual Copies	$ 4.00 (V)
Available from Vol 1 No. 1 January 1988	
All of 1988 Bound	$ 16.00 (Z)
All of 1989 Bound	$ 18.00 (Z)
All of 1990 Bound	$ 20.00 (Z)
All of 1991 Bound	$ 22.00 (Z)
All of 1992 Bound	$ 24.00 (Z)
CN80 INDEX on Disk	$ 2.00 (V)
Complete index for CN80 1988 thru 1992. 24 classifications of search. Specify LSDOS 6.3 or TRSDOS 1.3	
CN80 NEWCOMERS GUIDE VOLUME 1	$ 7.95 (V)
Reprint of all CN80 "Newcomers Corner" part 1 to 8.	

CN80 DISK SERIES

NUMBER 1 programs printed in Vol 1 No. 1 thru No. 6.

NUMBER 2 programs printed in Vol 1 No. 7, 8 and 9.

NUMBER 3 programs printed in Vol 1 No.10, 11 and 12.

NUMBER 4 programs printed in Vol 2 No.1, 2 and 3.

NUMBER 5 programs printed in Vol 2 No.4, 5 and 6.

NUMBER 6 programs printed in Vol 2 No.7, 8 and 9.

NUMBER 7 programs printed in Vol 2 No.10, 11 and 12.

NUMBER 8 programs printed in Vol 3 No.1, 2 and 3.

NUMBER 9 programs printed in Vol 3 No.4, 5, and 6.

NUMBER 10 programs printed in Vol 3 No.7, 8, and 9.

NUMBER 11 programs printed in Vol 3 No.10, 11, and 12.

NUMBER 12 programs printed in Vol 4 No. 1, 2, and 3.

NUMBER 13 programs printed in Vol 4 No. 4, 5, and 6.

NUMBER 14 programs printed in Vol 4 No. 7, 8, and 9.

NUMBER 15 programs printed in Vol 4 No. 10, 11 and 12.

NUMBER 16 programs printed in Vol 5 No. 1, 2 and 3.

NUMBER 17 programs printed in Vol 5 No. 4, 5 and 6.

NUMBER 18 programs printed in Vol 5 No. 7, 8 and 9.

NUMBER 19 programs printed in Vol 5 No. 10, 11 and 12.

NUMBER 20 programs printed in Vol 6 No. 1, 2 and 3.

NUMBER 21 programs printed in Vol 6 No. 4, 5 and 6.

NUMBER 22 programs printed in Vol 6 No. 7, 8 and 9.

NUMBER 23 programs printed in Vol 6 No. 10, 11 and 12.

$ 5.00 PER DISK (V).

For your convenience advance orders for the Disk Series are accepted. Disks are shipped to you automatically as soon as they are ready. Write or call for free CN80 Disk Series Catalog.

PLEASE NOTE: All CN80 DISK SERIES are on FLIPPY 5-1/4"disks; TRS/LS-DOS 6.3 format on Side 1 and TRSDOS 1.3 format on Side 2. Also available on 3-1/2" disks @ $5.50 each (LSDOS 6.3.1 or LDOS 5.3.1 format only). Each Disk Series has Bonus programs.

MANUALS & PROGRAMS PUBLISHED BY CN80

MARK REED'S MOD 4 UTILITY DISK $ 14.95 (Z)
Sixteen useful utilities for every Model 4 owner.

MARK REED'S MODEL 4 ED-IT $ 17.95 (Z)
For TRSDOS 6.2 or LS-DOS 6.3. New full-screen text editor. Powerful enough for a programmer yet simple enough for the causal user.

PATCH UTILITY PROGRAM FOR TRSDOS 1.3 $ 10.00 (V)
by Henry H. Herrdegen. This program contains all the patches for TRS-DOS 1.3, patches for Scripsit, and for "Profile III+, plus program to install the patches.

Z80 MACHINE LANGUAGE TECHNIQUES $ 22.95 (Z)
For the TRS-80 by Don Ady. 236 8-1/2 x 11 pages. "Presenting all the required fundamentals of Machine Language Programming, with practical applications."

PACK for Model 1/3/4 $ 17.95 (Z)
BASIC Program Packer by David Goben.

PACK - MS-DOS Version $ 17.95 (Z)
BASIC Program Packer by David Goben.

DEA Disk Editor and Assembler $ 49.85 (Z)
For Mod I/III/4 by David Goben. Extends your computing power and Assembling Language editing and assembling. 118 Pages 8-1/2 x 11 format.

T62DOSXT Upgrade TRS 6 Dating $ 18.00 (X)
by David Goben. Extends TRSDOS 6.x date entry beyond Dec. 31, 1987, patches & utility programs.

BUSY-CALC Spreadsheet Program $ 79.95 (Z)
by David Goben. Small business & family spreedsheet program. Model 4/4P/4D; TRSDOS 6.x, LSDOS 6.3.x.
BUSY-CALC DEMO DISK ONLY $ 10.00 (V)
Redeemable against purchase price of BUSY-CALC.

BCX Spreadsheet Program $109.00 (Z)
by David Goben. For Model 4's with Extended Memory (minimum of 128k required).
BCX DEMO DISK ONLY $ 15.00 (V)
Redeemable against purchase price of BCX.

DAVID'S MODEL 3 FILE UTILITIES $ 9.00 (Z)
by David Goben. Eight powerful programs for LDOS 5.x.

DAVID'S MODEL 3 SYSTEM UTILITIES $ 16.00 (Z)
by David Goben. 14 powerful programs designed for use with LDOS 5.x systems.

DAVID'S MODEL 4 FILE UTILITIES $ 9.00 (Z)
by David Goben. Nine powerful programs that save hours of work for TRS/LSDOS 6.x systems.

DAVID'S MODEL 4 SYSTEM UTILITIES $ 16.00 (Z)
by David Goben. 16 powerful programs designed for use with TRS/LSDOS 6.x systems

SCRIPT Word Processor $ 37.95 (Z)
for Model I, III, or 4/4P/4D by David Goben.
Specify Version when ordering:
- Model III TRSDOS 1.3
- Model I or III LDOS
- Model I NEWDOS/80 v 1
- Model I or III NEWDOS/80 v 2
- Model 4/4P/4D TRSDOS/LSDOS 6.X
- Model 4/4P/4D DOSPLUS

SCRIPT SPELLING VERIFIER $ 37.95 (Z)
by David Goben.

SUPERSCRIPSIT SPELLING CHECKER $ 37.95 (Z)
by David Goben.
Specify version when ordering Spellers
Model I, III, 48k, 2 disk drives minimum required.
Model 4· 64k, 2 disk drives minimum required.

MODEL 3 FBACKUP by David Goben $ 15.00 (Z)
LDOS 5.x. Very fast and versatile backup utility.

MODEL 4 FBACKUP by David Goben $ 15.00 (Z)
Very fast and versatile backup utility for Model 4.

MODEL 3 FASTBACK by David Goben $ 29.95 (Z)
LDOS 5.x systems. Very fast hard drive backup prg.

MODEL 4 FASTBACK by David Goben $ 29.95 (Z)
TRS/LSDOS 6.x systems. Very fast hard drive prg.

MODEL 3 FFORMAT by David Goben $ 15.00 (Z)
Fast FORMAT for Model 3 using LDOS 5.3.x.

MODEL 4 FFORMAT by David Goben $ 15.00 (Z)
Fast FORMAT for Model 4 using LSDOS 6.3.x.

HARD DISK BUILDER by David Goben $ 10.00 (V)
Build your own hard disk driver.

HI-RES UTILITIES PACKAGE by David Goben $ 15.00 (Z)
Nine utilities to perform general graphics maintenence from DOS ready.

POSTMASTER SUPPORT UTILITIES by D.Goben $ 39.00 (Z)
Ten programs create icons for PostMaster.

POSTMASTER 24 by David Goben $ 15.00 (Z)
Utility programs allow PostMaster by David Miller to be used on a 24 pin dot matrix.

SUBDIRCTORY by David Goben $ 19.95 (Z)
Build subdirectories on hard drives or floppies.

DISKOPT UTILITY PACKAGE by David Goben $ 29.95 (Z)
Disk optimoizer and file defragmenter for hard drives or floppy disk drives. Super fast.

MAGICDRAW by David Goben $ 65.00 (Z)
Powerful drawing program.

MAGICDRAW FONTS 16 Optional Font Packages for MagicDraw.

Font Disk 01	$12.50	Font Disk 09	$20.00
Font Disk 02	$15.00	Font Disk 10	$12.50
Font Disk 03	$15.00	Font Disk 11	$17.50
Font Disk 04	$20.00	Font Disk 12	$27.50
Font Disk 05	$15.00	Font Disk 13	$12.50
Font Disk 06	$12.50	Font Disk 14	$15.00
Font Disk 07	$12.50	Font Disk 15	$17.50
Font Disk 08	$17.50	Font Disk 16	$12.50

Add $4 per order for Font Disks. Sample and description of fonts per disk are contained in the MagicDraw Manual.

SMALL C COMPLIER FOR LS-DOS $ 45.00 (Z)
by David Goben Programm in Small C on the Model 4.

REMBRANDT Graphics Toolkit $ 39.95 (Z)
by Spectre Technologies. Graphic software for Mod 4/4D/4P, TRSDOS/LSDOS, hi-res board is not required.

LONG & LOUD Sideways & Banner $ 34.95 (Z)
by Spectre Technologies. Mod 4/4D/4P TRSDOS/LSDOS,
Order both Rembrandt and Long & Loud for $ 67.50 (Z)

ASTROCAL by Vernon B. Hester $ 29.95 (Z)
Turn your Model 1, 3, 4/4P/4D in to a programmable calculator. Manual and diskette w/built-in operating system, ready to run. Specify computer Model 1,3,4.

TRSCAN by J.F.R. Slinkman $ 45.95 (Z)
Scanner program for Chinon DeskScan 2000 with Model 4 using LSDOS 6.3.0 or 6.3.1.

ROMCLOCK3 UTILITY PACKAGE $ 5.00 (Z)
by David Goben. Clock operating system for SmartWatch or No Slot Clock LDOS 5.3.1 version.

ROMCLOCK4 UTILITY PACKAGE $ 5.00 (Z)
by David Goben. Clock operating system for SmartWatch or No Slot Clock TRS/LS 6.3.1 version.

POSTMASTER $ 40.00 (Z)
by David P. Miller Make labels, letterheads Posters with a variety of Fonts and picture Icons.

MS UTILITIES by David P. Miller $ 30.00 (Z)
Transfer files between TRS/LS DOS disks and MS-DOS disks. Format MS disks on a model 4.

DAVE'S MOUSE MENU $ 15.00 (Z)
Create a DOS command menu for use with keyboard arrow keys or mouse.

ARRANGER II $ 39.95 (Z)
by Dan Foy. Disk index program for TRS-80 Model I, III, 4/4D/4P. Automatically recognizes all major TRS-80 disk operating system formats.

ANSITERM 4 by Richard VanHouten $ 30.00 (Z)
TRS-80 Mod 4 High Resolution Communications Program. Supports ANSI & AVATAR control codes, IBM graphics, & file transfer by X or Y modem.
Hi-Res board required.

MINE FIELD by Richard VanHouten $ 12.00 (Z)
Game program, find all the mines in a mine field without setting one off.

IDIM by Leonard J. Lorden $ 80.00 (Z)
Model 4 BBS Host System Program. Build your own custom Bulletin Board.

MOUSEDOS by Leonard J. Lorden. $ 25.00 (Z)
Build your own DOS command menu with the cursor operated by a mouse. Easy to set up, easy to use.

GIF4MOD4 $ 37.95 (Z)
by J.F.R. Slinkman. Send or receive GIF hi-res graphics to & from different types of computers with your Mod 4.

SLOT4 $ 14.95 (Z)
by J.F.R. Slinkman. Accurate simulation of 1930's Mills slot machine. True revolving dials, moving handle, and realistic sound effects. Mod 4 & Hi-Res required.

VIDPOKR4 $ 19.95 (Z)
by J.F.R. Slinkman. Play real video poker on your computer. Remarkable screen renditions of playing cards. Mod 4, 128k, & Hi-Res required.

The CN80 MOUSE HOUSE PRODUCTS

MOUSE+ DRIVER by David Goben $ 10.00 (Z)
Complete Mouse Driver Program and manual for 2 or 3 button mice for Model 4. Write your own mouse programs in BASIC or program language.

M T K by David Goben $ 18.00 (Z)
Mouse to Keyboard Interface program w/manual for 2 or 3 button mice for Model 4. MOUSE DRIVER Required.

THREE BUTTON MOUSE $ 26.95 (Z)
Three button mouse and adapter for RS-232 connection.
NOTE: Model 4s w/RS-232 connector pointing down require an Extender Cable $8.00 + $2.00 S&H.

CN80 COMBINATION MOUSE PACKAGE
M4s w/RS-232 connector out the back $ 52.95 (Z)
M4s w/RS-232 connector on the bottom $ 59.95 (Z)
Includes: 3 button mouse w/adapter, and extender cable if needed (see pricing above), Mouse+ Driver program and M T K Interface program.

MOUSE HOUSE HOLSTER $ 1.75 (X)
Holds mouse on side of computer out of the way.

MOUSE PAD $ 2.45 (Z)
Better Mouse control, foam pad nonslip surface.

MOUSE CABLE ADAPTERS $ 2.95 (W)
Male 9 pin to Male 25 pin

BOOKS

DISK INTERFACING GUIDE/MOD I $ 1.85 (V)
by William Braden Jr. Out of print book.

101 COMPUTER BUSINESS IDEAS $ 7.95 (A)
by Wally Wang. "If you'd like your computer to work for you-and help you earn money-this is the book to read."

HOW TO GET STARTED WITH MODEMS $ 8.95 (A)
by Jim Kimble. "...covering everything the beginning modemer needs to know-from purchase and installation".

SIMPLE COMPUTER MAINTENANCE & REPAIR	$ 2.95 (A)
by Wally Wang and Scott Millard. "...understandable, inexpensive and easy maintenance solutions.	
THE OFFICIAL COMPUTER WIDOW'S	$ 7.95 (A)
(and Widower's) HANDBOOK by Experts on "Computer Widow/Widowerhood. Enjoyable...Funny...Perfect gift.	
ROOKIE PROGRAMMING	$ 8.95 (A)
by Ron Dippold. Introduction to programming for beginners and newcomers. BASIC, C and Pascal.	

LASER and DOT MATRIX PRINTER DRIVERS

ALLWRITE HP LASER SUPPORT PACKAGE, Model 4/4P/4D	$ 20.00 (Z)
ALLWRITE DESKJET SUPPORT PACKAGE, Model 4/4P/4D	$ 20.00 (Z)
SUPERSCRIPSIT HP LASER DRIVER Model I,III,4/4P/4D	$ 20.00 (Z)
SCRIPSIT PRO HP LASER DRIVER Model 4/4P/4D	$ 20.00 (Z)
SUPERSCRIPSIT FX80 DRIVER Model I,III,4/4P/4D	$ 17.95 (Z)
SCRIPSIT PRO FX80 DRIVER Model 4/4P/4D	$ 17.95 (Z)

LASER SOFT FONT PACKAGES

SPECIFY WORD PROCESSOR:

SuperSCRIPSIT for the Model III
SuperSCRIPSIT for the Model 4
Scripsit PRO for the Model 4

Font style	Point Size (Height of Letter)
Century	10 point
Amertype	10 point
Legal	10 point
Helvetica	10 point
Optimas	10 point
Palitine	10 point
Times Roman	10 point
Palitine	12 point
Centrum	12 point
Optimis	12 point
Helvetica	12 point
Palitine	8 point

Each Font Package supports normal, bold and italics printing of letters. Thirty-six soft font packages in all, Twelve soft fonts for each word processor supported.

Prices are $10 for each soft font package, plus (Z)
Discounts for multiple font orders are:
5 Font Packages for $ 45.00 (Z)
10 Font Packages for $ 90.00 (Z)
12 Font Packages for $ 96.00 (Z)

FILE CABINET CATALOGS

MODEL 4 TRS-80 PUBLIC DOMAIN	$ 2.00 (V)
MODEL 4 HIGH RESOLUTION	$ 2.00 (V)
MODEL 4 MACPAINT HIGH RESOLUTION	$ 2.00 (V)
TRS-80 MODEL 1/3 PUBLIC DOMAIN	$ 2.00 (V)
SYMPHONY 90 MUSIC LIBRARY CATALOG	$ 3.00 (V)

SYMPHONY 90 MUSIC SYSTEMS FOR THE MODEL 4

SYMPHONY 90 COMPOSER SYSTEM	$ 39.95 (Z)
Specify Model 4 or Model 3 Version	
SYMPHONY 90 PLAYER SYSTEM	$ 17.95 (Z)
Specify Model 4 or Model 3 Version	

SYMPHONY 90 MUSIC INTERFACE UNIT WITH AMPLIFIER
Sold only with Composer or Player program.

Interface and Composer System	$114.00 (Z)
Specify Model 3 or Model 4 Versions.	
Interface and Player System	$ 92.00 (Z)
Specify Model 3 or Model 4 Versions.	

TRSLINK LIBRARY DISKS

TRSLINK issue 1 to 48 only	$ 1.50 (V)
(5-1/4" LSDOS 6.3 or 5-1/4" TRSDOS 1.3)	
Complete set 1 to 48 $ 36.00 (Z) (Flippy Disks Only)	

SPECIALTY PROGRAM

SPECTECH Disk#1	$ 5.00 (V)
A collection of electronic and other formula programs.	

DISK OPERATING SYSTEMS (DOS)

TRSDOS 1.3 R/S Cat # 26-0312	$ 7.00 (X)
Model 3, Disk Operating System and BASIC	
LDOS 5.3.1	$ 39.95 (Z)
Model 3 Disk Operating System and Basic Interpreter.	
LS-DOS 6.3.1 R/S Cat # 700-2297	$ 39.95 (Z)
Model 4 Disk Operating System and Basic Interpreter	

LABELS

One Wide Labels for Mail or Disks Pressure Sensitive, Quality Guaranteed.

3-1/2 x 15/16 Plain Permanent Mailing Labels	
1000 per package	$ 4.22 (B)
5000 per Box (One Box)	$ 11.95 (B)
More than one 5000 pc. box	$ 10.95 (B)
3-1/2x 1-7/16 Plain Permanent Mailing Labels	
1000 per package	$ 5.25 (B)
5000 per box	$ 22.95 (B)
More than one 5000 pc. box	$ 20.66 (B)
4 x 1-7/16 Plain Removable Labels	
1000 per package	$ 7.45 (B)
5000 per box (One Box)	$ 26.95 (B)
More than one 5000 pc. box	$ 24.95 (B)
4 x 1-7/16 Plain Permanent Mailing Labels	
1000 per package	$ 5.25 (B)
5000 per box (One Box)	$ 22.95 (B)
More than one 5000 pc. box	$ 20.66 (B)

DISKETTES

FLOPPY DISKS	$ .40 (C)
5-1/4 Double/Single Sided Disks DD. 100% Error Free Lifetime Guarantee with Paper Sleeves, Labels & Read/Write Tabs.	
FLIPPY DISKS	$ .60 (C)
5-1/4 Single Sided DD on both sides. Premium Quality with two notches by factory. American made by Name brand mfg. 100% Error Free. With Paper Sleeves, Labels & R/write Tabs.	
3-1/2" DISKS	$ .69 (D)
Premium Quality DS/DD by Major US mfg. Complete with sleeves and labels, 100% Error Free, Lifetime Warranty. American Made - Bulk Platinum Brand by Syncom.	
5-1/4" TYVEK SLEEVES (25 per pk)	$ 1.25 (U)
COLOR CODED DISK LABELS	
Five Color 5.25 Write-On Disk Labels 10 labels w/10 read-write tabs per sheet 100 per package	$ .50 (U)
FLOPPY DISK MAILERS	
Self-Sealing Mailer package of 10	$ 3.35 (Z)
Holds one or two 5-1/4 floppy disks.	

SELECTOR SWITCHES

A-B SWITCH, PARALLEL	$ 18.75 (Z)
With three female 36 conductor centronics connectors.	
A-B SWITCH, SERIAL, RS232	$ 18.75 (Z)
With three DB25 Female connectors.	
THREE POSITION SERIAL SWITCH	$ 20.95 (Z)
w/4 DB25 Female connectors	

FOUR POSITION SERIAL SWITCH w/5 DB25 Female connectors.	$ 22.95 (Z)

CABLES REQUIRED BETWEEN AB SWITCH and PRINTER

Printer to Selector Switch 6'	$ 13.49 (E)
Printer to Selector Switch 10'	$ 15.95 (E)
Printer to Selector Switch 15'	$ 18.95 (E)

RS232 SERIAL CABLES

RS232 Serial Cable 6 ft. Equal to Radio Shack #26-240, Male - Female	$ 8.95 (E)
RS232 Serial Cable 6 ft. Equal to Radio Shack #26-249, Male - Male	$ 8.95 (E)
RS232 NULL MODEM Cable 6 ft Connect two computers together.	$ 9.95 (E)
RS-232 EXTENDER CABLE For computers w/RS-232 connector pointing down on the bottom of the computer.	$ 8.00 (Z)

HARD DRIVE CABLES

HARD DRIVE CABLE 4 ft w/50 pin Edge Card connector & H D pin connector.	$ 16.00 (Z)

PRINTER CABLES for TRS-80 & 1000 COMPUTERS

Flat Ribbon 6', Mod III/4/4D&P Printer Cable	$ 12.95 (E)
Flat Ribbon 12', Mod III/4/4D&P Printer Cable	$ 15.00 (E)

DISK CLEANING, DUST COVERS

5-1/4" DISK DRIVE CLEANING KIT	$ 4.90 (Z)
3-1/2" DISK DRIVE CLEANING KIT	$ 5.25 (Z)
UNIVERSAL PRINTER DUST COVERS For printers up to 16" wide, anti-static vinyl.	$ 9.75 (Z)

INTERNAL HALF HEIGHT DOUBLE SIDED DISK DRIVES

Internal Half Height 5-1/4 360K	$ 67.00 (Z)
Internal Half Height 3-1/2 720K	$ 67.00 (Z)
Half Height Filler Plate	$ 4.00 (V)
Internal 2 Drive Cable Specify: Model 4 Gate Array or Non-Gate Array. Model 4D or 4P. S&H included when ordered with drives.	$ 10.00 (X)
50 Pin Y CABLE Enables hard two units to be connected to the I/O-Bus at the same time.	$ 18.00 (Z)

EXTERNAL HALF HEIGHT DOUBLE SIDED DISK DRIVES COMPLETE WITH CASE AND POWER SUPPLY

One Disk Drive Unit One 5-1/4 360K or One 3-1/2 720K Unit.	$143.00 (S)
Two Disk Drive Unit Two 5-1/4 360K drives, or two 3-1/2 720K drives. Or one 5-1/4 360K and one 3-1/2 720K drive.	193.00 (S)

MEMORY CHIPS for MODEL 4

64K UPGRADE KIT Includes 8 150ns 128 refresh cycle dynamic ram chips, plus instructions and Memory Test Disk.	$ 12.95 (Z)
PAL CHIP Required to upgrade Non-Gate Array Model 4s.	$8.00ea (V)

MICRO-LABS HIGH RESOLUTION BOARDS

GRAFYX SOLUTION for Model 3/4/4P/4D Free Draw Program included. Specify Model when ordering because the boards are different for each Model. Model 3, Model 4P, Model 4 Non-Gate Array or Model 4 Gate Array.	$99.00 (Z)

MISCELLANEOUS HARDWARE

HI-RES BOARD EXTENDER BLOCK Used to raise graphic board when other boards have been installed. Normally not required. Can also be used to raise other 34 pin header, type boards. Specify height: 3/16", 5/16", or 5/8"	$ 5.50 (X)
ROMCLOCK4 - CLOCK CHIP Clock chip with ROMCLOCK4 or ROMCLOCK3 Utility program package and installation instructions. Keep time and date current. 10 year lithium battery.	$ 35.95 (Z)
I/O-BUS CLOCK Realtime clock uses exterior I/O Bus, no internal connections or wiring.	$ 59.00 (Z)
I/O-BUS LD INTERFACE Connect an exterior disk drive unit to your 4P or Model 4/4D, not required for the first two drives on your Model 4/4D.	$180.00 (Z)
ASTEC 65 WATT POWER SUPPLY for Model 4/4P/4D.	$ 82.00 (Z)

ADD SHIPPING & HANDLING CHARGES LISTED BELOW TO YOUR ORDER

$10 Maximum S&H charge for United Parcel Ground Service. Add the shipping and handling charges per item ordered, if it exceeds $10 for shipment in the 48 states then add only $10 to your order for shipping and handling.

(A) - Add $4 for 1 to 4 books in US; $5 in PR, AK, HI, APO, FPO, & Canada; $5 all others.
(B) - Add $4 for ea. label package. $5 for 1 box of labels. $4 per box for more than a one box shipment.
(C) - Add $4.00 per order of 5-1/4". floppy or flippy disks.
(D) - Add $4.00 per order of 3-1/2" disks.
(E) - Add $4 for one or more cables.
(S) - Add $6 Shipping & Handling
(T) - Add $4 for One Item; $6 for Two or More.
(U) - Add .50 cents per package.
(V) - Shipping & Handling Included.
(W) - Add $1 Shipping & Handling.
(X) - Add $2 Shipping & Handling.
(Y) - Add $3 Shipping & Handling.
(Z) - Add $4 Shipping & Handling.

Shipments are made by UPS ground service whenever possible. Please use street address and include phone number when ordering. Consistent with industry standards no refunds are made for opened software, manuals, intergrated circuit chips or computer parts. Replacement limited to defective material only. No returns without written authorization.

Check or Money Order Payment Only - We do not accept Credit Card orders. C.O.D. add an additional $4.50 per order. APO, FPO, HI, AK, PR, and Canada add an additional $2 per order unless otherwise stated. Wyoming Residents Only add 4% Sales Tax. Prices subject to change without notice.

Order from: Computer News 80, PO Box 680, Casper, WY 82602-0680; (307)265-6483
Monday thru Friday - 8am thru 5pm - Mountain Time
Government, School, and Rated Corporation Purchase Orders Welcome

Sixteen Model 4 Programs!

Mark Reed's Model 4 Utility Disk now contains 16 useful utilities for everv Model 4 owner:

- **CLOSE**, to close all open files on a disk;
- **CMDEDIT**, to provide command line editing and recall at "DOS Ready";
- **CMDINST**, to install CMDEDIT on the system disk in drive zero;
- **CMDSTORE**, to install CMDEDIT's special high memory storage area;
- **DSP**, to display control codes and graphics characters;
- **MAPMEM**, to list all low and high memory modules;
- **MOVE**, to transfer files from one drive to another;
- **PRINT**, to format and print text files;
- **PRT**, to print control codes and graphics characters;
- **RECLAIM**, to remove unused high memory modules;
- **SETMOD**, to set or reset files' MOD flags;
- **SETVIS**, to make files visible or invisible;
- **SWAP**, to exchange disk drive numbers;
- **UNFILTER**, to remove a filter from a device without resetting the device;
- **VLOAD**, to display specially formatted disk files; and
- **VSAVE**, to save the display to a specially formatted disk file.

The Utility Disk comes with a help file, a 23-page manual, and full support from the author. Order your copy today for only $14.95 (plus shipping and handling) from *Computer News 80*, P.O. Box 680, Casper, WY 82602-0680.

Introducing
ED-IT for the Model 4
by Mark Allen Reed

For TRSDOS 6.2 or LS-DOS 6.3. ED-IT is a brand new full-screen text editor that combines power, versatility, and ease of use. Its features include fast operation, a large text buffer (nearly 47K with no high memory modules installed), an easy-to-use menu system (activated by the <BREAK> key), three special programming modes (for assembly language, BASIC, and C), word-wrap capability, block operations (including delete, copy, move, save, and load), search operations (including find, change, change to the end of the file, repeat last find or change, and jump to specific line number), and the ability to enter any ASCII character into the document. ED-IT also allows you to execute nearly any DOS command without leaving the editor or affecting the text buffer. You can view a disk directory, purge unwanted files, even FORMAT and BACKUP from within ED-IT!

ED-IT is powerful enough for a programmer, yet simple enough for the casual user. It is excellent for editing README files, patch listings, and job control language (JCL) files. ED-IT comes with a complete instruction manual and full support from the author. Order your copy today for only $17.95 (plus shipping and handling) from *Computer News 80*, P.O. Box 680, Casper, WY 82602-0680.

4/4P Users!

T/Maker

$29

(While they last)

T/Maker	$29
Tandy 2000 or IBM Compatible disks	+$20

T/Maker Integrated Software includes:

WORD PROCESSOR
SPELLING CHECKER
DATABASE
SPREADSHEET
BAR CHARTS
UTILITITES
APPLICATIONS LANGUAGE

Add $6.00 for ground shipment or $8.00 for 2nd day air shipment. California residents add 8&1/4% sales tax.

T/MAKER RESEARCH COMPANY
812 Pollard Road (Suite 8), Los Gatos, CA 95030
(408) 866-0127

T/Master (The Next Generation for DOS) **$177**

I Hate Algebra

THE INCREDIBLE WINDOWS 3.0 SPREADSHEET
THAT WORKS LIKE A CALCULATOR

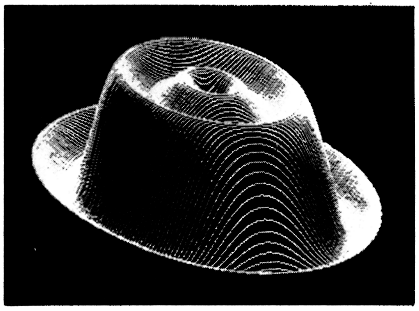
$39.95

Grafyx Solution™

HIGH RESOLUTION BOARD FOR MODEL 3/4/4P/4D
Distributed by Computer News 80

Free Draw Program Included

Hi-Resolution Graphics for Mod 4/4D/4P/III



Superior Hardware. The Grafyx Solution provides 153,600 pixel elements which are arranged in a 640 × 240 or on the Model III a 512 × 192 matrix. Hundreds of new business, personal, engineering, and educational applications are now possible. The hi-res display can be shown on top of the standard display containing text, special characters, and block graphics. This simplifies program debugging, text labeling, and upgrading current programs to use graphics. The Grafyx Solution fits completely within any tape or disk based Model 4, 4D, 4P, or III. Installation is easy with the plug-in, clip-on Grafyx Solution board.

Superior Basic. Over 20 commands are added to the Basic language. These commands will set, clear or complement points, lines, boxes, circles, ellipses, or arcs. The hi-res screen can be printed on any of 30 popular printers or saved or loaded to disk without leaving Basic. Areas may be filled in with any of 256 patterns. Sections of the screen may be saved and then put back using any of five logical functions. Labels can be printed in any direction. The viewing area can be changed. The entire screen can be complemented or cleared. Graphics Basic provides dot densities of 640 × 240, 320 × 240, 160 × 240, and 160 × 120, all of which can be used in the same display.

Superior Software. The board comes with over 40 programs and files which make it easier to use, serve as practical applications, demonstrate its capabilities, and serve as programming examples. The software works with TRSDOS 1.3, 6.1.2, 6.2, 6.3; Dosplus 3.4, 3.5, 4; LDOS; and Newdos80. The Grafyx Solution is also supported by 30 optional applications programs: Draw, Bizgraph, xT.CAD, 3D-Plot, Slideshow, Mathplot, Surface Plot, Chess, etc.

Purchase a Grafyx Solution Hi-Res Graphics Board for $ 99.00 and receive a free copy of DRAW a powerful graphics program which allows drawing or designs to be easily created on a Model III/4/4P/4D.

$ 99.00 Add (Z) S&H

Specify Model 3, Model 4p,
Model 4 Gate Array, or
Model 4 Non Gate Array
when ordering. The boards
are different for each.
Please include phone number.

SAVE WITH OUR HIGH RESOLUTION
COMBINATION PACKAGE
NUMBER ONE

MicroLabs Grayfyx Solution Board
MicroLabs Draw Program
PostMaster Program
Hi-Res Utilities Program
PostMaster Support Utilities
Five HiRes File Cabinet Volumes

A $210.50 value if purchased seperately.

All for the Super CN80 low price of

$166.95

Add (Z) S&H

SUPER SAVER

ALREADY HAVE YOUR HIGH RESOLUTION
BOARD INSTALLED - THEN

SAVE WITH OUR HIGH RESOLUTION
COMBINATION PACKAGE
NUMBER TWO

PostMaster Program
Hi-Res Utilities Program
PostMaster Support Utilities
Five HiRes File Cabinet Volumes

A $111.50 value if purchased seperately.

All for the Super CN80 low price of

$ 75.95

Add (Z) S&H

SUPER SAVER

Used Tandy

ATTENTION!

Used Tandy

New Low Prices
More Computers Than Ever!

COMPUTERS

Model 3, 2 Dr.	$135	Tandy 1000 TX	$295
Model 4, 2 Dr.	$195	Tandy 1000 SL	$245
Model 4, 2 Dr. 128 K	$235	Tandy 1000 TL	$275
Model 4P, 2 Dr.	$175	Tandy 1000 TL-2	$295
Model 12, 2 Dr.	$245	Tandy 1000 TL-3	$345
Model 4D	$345	Tandy 2000 2 FD	$ 99
Tandy 2000 HD	$245	CM-5	$ 99
Tandy 6000 HD	$595	CM-11	$135
Tandy 3000, 4000	Call	CM-2	$ 99
Tandy 1000 RL 20 Meg	$295	CM-1	$ 99
Tandy 1000 EX/HX	$145	VM 5	$ 55
Tandy 1000 A 2 FD	$135	VGM 220	$195
Tandy 1000 HD	$245	VGM 200	$225
Tandy 1000 SX	$175		

ACCESSORIES

Tractor feed for 2100	$115	DW II sheet feeder (new)	$ 95
Tractor feed for DW II, 510	$ 95	DMP 2100 sheet feeder	$195
Tractor feed for 410 (new)	$ 39		

LAPTOPS

Model 100, 24K	$135	Tandy 1500 HD	$695
Model 200	$295	Model 102	$195
Model 600	$125	Nec 8201 16K	$ 85
Tandy 1400 LT	$375	Tandy 1400 HD	$595
Tandy 1100 FD	$395	Nec Multispeed	$275
WP-2 Port. word proc.	$135	Nec 8500	$195

HARD DRIVES
for model 3's and 4's

Tandy 5 Meg HD.	$195	20 Meg IDE HD.	$125
Tandy 12 Meg HD.	$225	Memory 640K EX/HX	$ 95
Tandy 15 Meg HD.	$245	Memory 640K 1000	$ 95
20 Meg Hard Card	$165		

*All hard drives include cable and software.

PRINTERS

DMP 105, 106	$ 55	DMP 2110 24 Pin	$315
DMP 120	$ 85	DWP 210	$ 75
DMP 130	$115	DWP 410	$ 95
DMP 133	$115	DWP 510	$125
DMP 200	$ 85	DWP II	$ 95
DMP 420	$115	DWP 520	$195
DMP 430	$145	Diconix 150 Inkjet Portable	$ 95
DMP 2100 24 Pin	$145	Brother HR 5 Portable	$ 45
DMP 2100P 24 Pin	$295		

SOFTWARE

Model 4 Software

Deskmate	$ 45	Double Duty (128K req. use 2 different programs at once)	$ 19
Payroll	$ 15	Quik Pro III	$ 15
Money Decisions Business Management	$ 10	Visicalc	$ 25
Money Decisions II Real Estate and Loan Analysis	$ 10	Videotex Plus	$ 19
Inventory Control	$ 20	Basic Compiler	$ 20
C Basic Language	$ 25	The Producer Disk System Owners Manual (program writer)	$ 30
Multiplan (spreadsheet)	$ 19	TRS DOS Version 6 4D	$ 29
Disk Scripsit	$ 25	TRS DOS Version 6 4/4P	$ 29
Accounts Payable	$ 25		

Model 3 Software

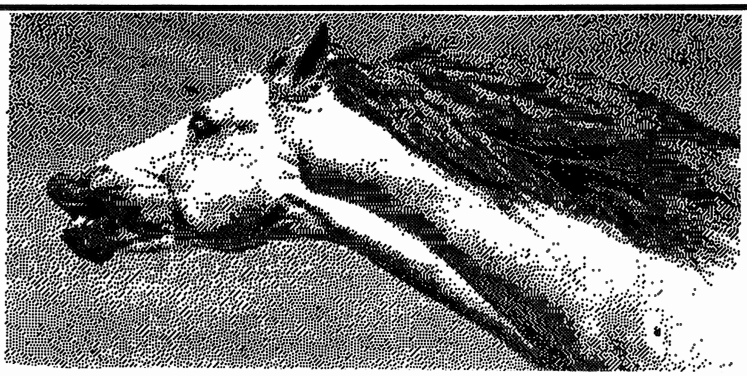
Coordinating Accounting System	$ 29	Disk System Owners Manual	$ 29
Disk Course	$ 20	General Ledger	$ 12
Micro Courier	$ 19	Superscript	$ 15
Computer Diplomacy	$ 20	Pascal	$ 29
Power Draw	$ 15	Power Tool	$ 15
Accounts Payable	$ 10	Video-Tex Plus	$ 15
Disk Payroll	$ 20	Inventory Control	$ 15
Modem 80	$ 20	Compiler Basic	$ 10
Disk Course	$ 15	Time Manager	$ 10
TRS 80 Business Graphics Analysis Pak	$ 20	Graphics	$ 15
Profile III Plus	$ 22	Business Programming	$ 12
Profile	$ 20	Business Programs	$ 12
Visicalc	$ 15	Mini Pacs (small bus. invoicing)	$ 10
Cobol	$ 19	Mini Pacs (small bus. accounting)	$ 10

*All equipment is guaranteed to be in good working order. *Equipment is cleaned and tested.
*Drives are cleaned and timed as needed.

We accept VISA & MasterCard or C.O.D. The above prices do not reflect shipping cost. Inventory changes daily; please call for availability. If you don't see what you need, please call and we will do our best to locate it for you.

PACIFIC COMPUTER EXCHANGE

The One Source For Used Tandy Equipment!
1031 S.E. Mill, Suite B • Portland Oregon 97214
(503) 236-2949



GIF GRAPHICS FOR YOUR MODEL 4

by J. F. R. "Frank" Slinkman

Send GIF (Graphics Interface Format) high resolution graphics to and receive high resolution graphics from computers of different types with your Model 4 and GIF4MOD4.

A HIGH RESOLUTION BOARD IS HIGHLY RECOMMENDED BUT NOT REQUIRED. If you have a high resolution graphics board, GIF4MOD4 will decode any GIF image up to 640 pixels x 480 pixels x 256 colors and put the image on your screen. If you do not have a high resolution board installed in your Model 4, GIFMOD4 converts a GIF format to /HR format. The HR utilities packages available from CN80 will print out the /HR images on your printer.

CONVERSION TO GIF FORMAT

The HR2GIF program included in this package converts your /HR, /CHR, and /BLK files to the GIF format so they can be viewed on IBM, MAC and other computers.

$37.95 + (Y) S&H --- Order from Computer News 80

ACCURATE

SIMULATION OF A

1930'S MILLS
SLOT
MACHINE

by J. F. R "Frank" Slinkman

Want to see a real rendition of a working slot machine on your Model 4 computer screen? Then SLOT4 is the one that will do it. True revolving dials for payoff, moving handle, with coin dropping sound.

Amuse yourself and your kids for hours on end. Entertain your guests at your next party with your computer by letting them play SLOT4.

Model 4 with High Resolution Board Required

$14.95 + (Y) S&H

Order from Computer News 80

ACCURATE

SIMULATION OF A

VIDEO POKER

MACHINE

by J. F. R "Frank" Slinkman

Play real poker on your computer with remarkable screen renditions of the playing cards. Optimum video poker strategy can be used on VIDPOKR4 or to play the real thing in Atlantic City or Nevada.

Any Poker fan will really enjoy playing against the computer, or practice the winning strategy that is included with this game package.

Model 4 with 128K and High Resolution Board Required

$19.95 (Y) S&H

Order from Computer News 80

PRINTERS FROM CN80 WITH PROVEN COMPATIBILITY

SEIKOSHA SP-2400
9 Pin Printer

80 Column Printer
300 Characters Per Second
IBM and Epson Compatible
Standard Parallel Interface
Built-In Push Tractor & Friction Feed
Easy Front Panel Controls
Paper Parking
Graphics
Two year Manufacturer's Warranty

$ 179

Add $ 6.00 S&H, Shipped by UPS only.

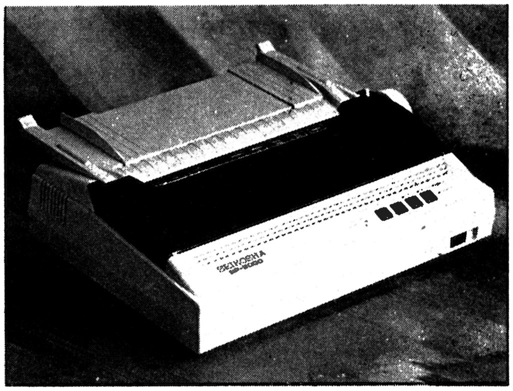
Fully supported by CN80 and completely compatible with PostMaster, Rembrandt, Long and Loud and all the programs, published by CN80. Will work with any Model III/4,4P or 4D computer.

SP2400 Ribbons
CN1041 $6.40 ea. $5.90 six or more.
SL-90 Ribbons
CN1046 $7.25 ea. $6.75 six or more.

SEIKOSHA SL-90 PLUS
24 Pin Printer

80 Column Printer
240 CPS draft / 80 CPS LQ
IBM and Epson Compatible
Standard·Parallel Interface
Built-In Push Tractor & Friction Feed
Easy Front Panel Controls
Paper Parking
Graphics 360 Resolution
Two year Manufacturer's Warranty

$ 279



PostMaster

Computer News 80

PostMaster by David P. Miller is a program that lets you create Posters, Letterheads and Mailing Labels with icons, borders, and many different character fonts using your dot matrix printer. The program runs on TRS-80 Model 4/4P/4D, with 64K or 128K of memory that has a MicroLabs or Radio Shack high resolution board installed.

This program has received the highest praise from reviewers of any program ever written for the Model 4. It allows you to use thousands of icons, borders, and fonts that are available from the File Cabinet Icon Library, it also allows you to add your own icons, borders and fonts.

Printers supported: Radio Shack DMP-130, -130A, -131, -132, -133, -430, -2100P, also any Radio Shack DMP printer with a 3-digit number with "3" as the second digit. All Epson and IBM printers. All other dot matrix printers that are Epson and IBM emulation printers. Seikosha SP-2000, -2000Plus, -2400. Okidata Microline 182 and 192. Panasonic KX-P1091, -1092, -1124, nonsuffixed. Star 10X, -15X, -NP, -NX, LC-10. C-ITOH 1510, 8510, C-130. (Note - Dot Matrix printers providing 300-dpi or 180-dpi may not work with PostMaster and no guarantees can be made concerning them.

Printers that are not supported are: Radio Shack DMP-110, -120, -400, -500, -2100. Panasonic suffixed printers 1124i, 1124e, etc. Okidata 82, 92, and Daisy wheel printers.

Order from Computer News 80.................$40................add S&H (Z)

TRANSFER FILES BETWEEN
Model 4/4P/4D and MS/PC

MS UTILITIES BY DAVID P. MILLER

Transfer files quickly and easily between your Model 4/4P/4D and IBM-PC Clones.

Transfer files from MS-DOS formatted disks to TRS/LSDOS formatted disks, or from TRS/LSDOS to MS-DOS formats on your Model 4 or 4P/4D.

Read MS-DOS formatted disk directories or format MS-DOS disks with your Model 4/4P/4D. Add linefeeds or strip linefeeds as needed.

$30.00 Plus S&H

David P. Miller is the author of PostMaster
MS-DOS Disk operating system by MicroSoft

DAVE'S MOUSE MENU
By David P. Miller

Build a up to twenty six DOS command menu with the ability to repeat the DOS command by pressing a keyboard letter, pressing the arrow keys to "point and shoot" or use your mouse for "point and shoot" selection.

No longer do you have to memorize DOS commands and parameters that you use all the time. Simply type them in once and then select them from the menu.

Fully compatible with the use of a mouse, keyboard or arrow keys.

$ 15.00 Plus S&H

David P. Miller is the author of PostMaster

Refer to March 1993 CN80 (Vol. 6 No. 3) for more information about Dave's Mouse Menu.

SMALL C COMPILER FOR LS-DOS

by David Goben © 1993

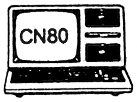
PROGRAM IN SMALL C - EASIER THAN ASSEMBLY LANGUAGE.....

The Small C package comes complete with a 216 page easy to comprehend manual. Three single-sided program disks provide you with the Small C compiler, program optimizer, macro assembler, linking loader, support libraries, library managers and more.

System requirements Model 4/4P/4D with LS-DOS 6.3.x.

$ 45.00 Plus S & H.

Available on 3-1/2" disks upon request at no charge.



LASER AND DOT MATRIX PRINTER DRIVERS

ALLWRITE HP LASER SUPPORT PACKAGE* $20.00
ALLWRITE HP DESKJET SUPPORT PACKAGE* $20.00
SUPERSCRIPSIT HP LASER DRIVER** $20.00
SCRIPSIT PRO HP LASER DRIVER* $20.00
SUPERSCRIPSIT FX80 DRIVER** $17.95
SCRIPSIT PRO FX80 DRIVER* $17.95

**Modes 4/4P/4D ** Model I,III,4/4P/4D*
Laser drivers support normal, bold, italics and proportional print with right hand justification.

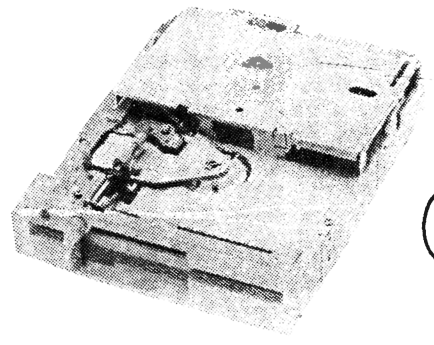
CN80 NEWCOMERS GUIDE

Reprint of CN80 Newcomers Corner articles, part 1 to part 8.
Learn what's important to start computing on a Radio Shack computer. Covers the basic DOS commands like Backup and Format and many more subjects, written in plain easy to understand English.

$7.95 (V) S&H

CHINON 5.25" Floppy Disk Drive

Low Power Consumption Plus High Performance



CUSTOM IC design in the read/write and control circuits gives maximum performance and low power consumption. A pop-up mechanism protects against mischucking upon disk insertion, allowing disks to be loaded/unloaded with ease. **Chinon 5.25" floppy disk drives** provide high speed access (3 ms)

DOUBLE SIDED HAlf HEIGHT DRIVES
Install in any Model 3/4/4P/4D

CHINON 3.5" Micro Floppy

High Storage Capacity.

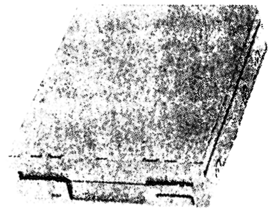
5-1/4" SPECIFICATIONS

360K Capacity
40 cyl. (track)

$67 each 5-1/4 or 3-1/2
Complete with installation instructions and CN80's support. Add $4 S & H per order in US.

Compatible with all
Model I, III, 4/4P/4D Computers
and All their operating systems.

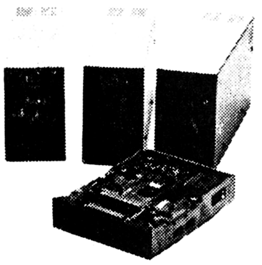
TWO DRIVE INTERNAL DRIVE CABLE
$10 add $2.00 S&H in US. S&H
included when ordered with drives.



3-1/2" SPECIFICATIONS

720K Capacity
80 cyl. (track)

- One Year Manufacturer's Warranty



EXTERNAL DISK DRIVES

From

Computer News 80

These external disk drives come in a metal case with power supply, power cord, and 4 ft. drive cable which plugs into the external disk drive connector on your computer. External disk drives are shipped complete via UPS ready for you to use, just plug them in and run. Plus you get our full support and two year warranty.

Add convenience and 720K storage space
with 3-1/2 disk drives to your system.
Complete with all cables ready to go
at one low price.
FULL TWO YEAR WARRANTY
On all parts and labor.

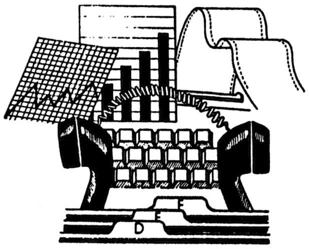
ALL DISK DRIVES ARE HALF HEIGHT DOUBLE-SIDED DRIVES

One disk drive unit........................$ 143.00
with one 5-1/4 360K
or 3-1/2 720K unit.

Two disk drive unit........................$ 193.00
with two 5-1/4 360K drives
or two 3-1/2 720K drives
or one 5-1/4 and one 3-1/2 drives.

Add $ 6.00 Shipping and Handling in the US only, all others contact us for shipping costs.

CHECK OR MONEY ORDER, NO CREDIT CARDS



ANSITERM 4

by Richard VanHouten

TRS-80 Model 4 High Resolution Communications Program.

Supports ANSI (American National Standards Institute) and AVATAR control codes. IBM graphics and file transfer by X-modem or Y-modem.

System requires Model 4 with Modem and High Resolution Board.

Program complete with printed manual.

$ 30.00 (Y) S&H Order from CN80

2400 Baud External Modem

from Computer News 80

$ 78

Plus $4 S &H

2400 baud transmission speed
Hayes compatible
Compatible with Model 3/4/4D/4P
Compatible with IBM PC/XT/AT
Auto dial/answer
Eight status indicator lights
Built-in speaker with volume control
Second jack for local phone
Call progress and error detection
Ten year manufacturer's warranty
Manufactured in the USA

Complete with all cables and TRS-80 Communication Software

CONNECTORS

DESCRIPTION	PRICE
FLAT RIBBON CABLE CONNECTORS	
50 Pin Male Edge Card Mating Connector	4.95
50 Pin 25x2 Edge Card/Female	1.75
50 Pin 25X2 Header Female/Socket	1.25
50 Pin 25x2 Header Male/Plug w/mounting	8.50
50 Pin 25x2 Header Male/Plug no mounting	8.50
36 Contact Centronics Male (Printers)	4.00
34 Pin 17x2 Header Female/Socket	1.95
34 Pin 17x2 Edge Card/Female	1.35
34 Pin 17x2 Header Male/Plug No Mounting	7.50
34 Pin 17x2 Header Male/Plug W/Mounting	7.50
25 Pin DB25 (RS232) Male/Plug	3.00
25 Pin DB25 (RS232) Female/Socket	3.00
PC BOARD MOUNT	
34 Pin 17x2 Box Header - Straight Solder	2.50
50 Pin 25x2 Box Header - Straight Solder	4.50

CONNECTOR S&H
Add $ 2.00 Shipping and Handling if ordered alone.
Shipping and Handling included if ordered with other items.

EXTENSION BLOCKS AND FLAT CABLE

DESCRIPTION	PRICE
EXTENSION CONTACT BLOCKS	
34 Pin 17x2 PCB Socket - 3/16" High	5.50
34 Pin 17x2 PCB Socket - 5/16" High	5.50
34 Pin 17x2 PCB Socket - 5/8" High	5.50

EXTENSION S&H
Add $ 2.00 Shipping and Handling if ordered alone.
Shipping and Handling included if ordered with other items.

FLAT RIBBON CABLE	
25 Conductor	.38 per ft.
34 Conductor	.51 per ft.
50 Conductor	.75 per ft.

CABLE S&H
Add $ 3.00 Shipping and Handling if ordered alone.
Shipping and Handling included if ordered with other items.

CUSTOM CABLES BUILT UPON REQUEST
Call for price quotes.

Symphony 90

Opening a new era of TRS-80 Computer Generated Music

Use the full power of your Model 4

Free Music Library Catalog with each order

for Player or Composer System

Plus a Limited Time Offer of

Free Menu Disk and Music Library Disks

Symphony 90
Music Library Catalog

Complete Catalog of Symphony 90
Music on Disks Ready to use with
the Symphony 90 Play System
$3.00 - Shipping & Handling Included

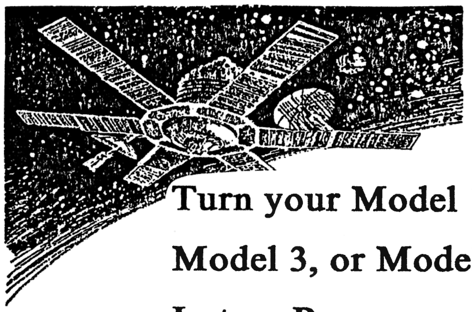
The **PLAYER SYSTEM** will play preprogrammed music files from the Symphony 90 Music Library or Orc-90 files. The Library Menu disk allows you to select and play all the files on a disk, or play one at a time. The **COMPOSER SYSTEM** allows you to write and edit your own music files. Together both Player and Composer give you a complete music system that allows you to listen to prewritten music files or to compose your own music files. But, if you only want to listen to a great variety of music compositions, then purchase only the Player System. Model III versions are also available if you do not have a Model 4.

Symphony 90
Player
Music Player Only System

Symphony 90
Composer
Music Composer System

Symphony 90 Interface with built-in amplifier and volume control. Use with your stereo amplifier and speakers, Or use with your headphones or separate speakers from the built-in amplifier.

Interface sold only with the Symphony 90 Composer or Player software. The interface is not sold separately
See Product Guide for prices.



Turn your Model 1,
Model 3, or Model 4/4P/4D
In to a Programmable
Calculator with

ASTROCAL

by VERNON B. HESTER

Designed for the student, or professional. Engineers, lab technicians, accountants, real estate brokers, designers, anyone who does repetitive or complex mathematical calculations.

10,000 Program Storage Location, 84 Labels, 100 Addressable Memory Registers, True Algebraic Entry.

This unique product intergrates mathematical programming functions in to a single convenient application. Develop scientific, financial and statistical programs with ease.

$29.95 Add (Z) S&H

ARRANGER II

100% Machine Language Disk Index Program for the TRS-80 Model I, III, 4/4D/4P
Automatically recognizes all major TRS-80 disk operating system formats.

The ARRANGER II written by Dan Foy almost ten years ago, is a master index system that automatically records the names of your programs, what disks those programs are on and the type of disk operating system the disk was formatted under.

Program Capacity..........................	11,000 programs optimum, 8,000 typical, 255 filenames per disk, 255 disks per library data file.
Disk Drive Compatibility..............	Reads 5-1/4" or 3-1/2" single-sided or double-sided; 35, 40, 80 track, and is auto self-configuration.
Functions....................................	Add Delete Scan View Find (Search) Print Rename Change Update Toggle Locate Manual Backup Exit
Printouts.......................................	Prints out three column 8-1/2 x 11 pages with your programs listed in alphabetical order or by extensions. Prints labels with Disk name, DOS type, and Type of disk, (system or data.)
System Requirements.................	Model I/III/4/4P/4D with one or more drives and 48K or more.

The greatest aid to keeping track of your disk library ever created for the TRS-80 computers, Your programs are printed in easy to read vertical alphabetized columns, unlike the horizontally alphabetized rows of the CAT program. You keep all your library on one disk in one library regardless of their DOS format type.

$39.95 Add (Z) S&H

HOWE SOFTWARE FOR MODEL I, III AND MODEL 4/4D/4P

Published and Distributed by Computer News 80

TYPITALL Word Processor $ 49.95

Word processor upwardly compatible with SCRIPSIT -- it reads your old SCRIPSIT files and uses the same formatting and cursor movement commands. Send any control/graphics character to the printer. Print formatted text on the screen, or send it to a disk file for later printing. Merge data from a file during printing. Assign any sequence of keystrokes to a single control key. Call up to 16 help screens at any time. Move cursor forward or backward by character, word, line, paragraph or page. Complete with easy to read manual.

TYPITALL Word Processor with Spelling Checker $ 79.95

Optional spelling checker has 29,500 word dictionary -- verify a 3.500 word document in less than two minutes.

SYSTEM DIAGNOSTIC $ 69.95

Complete tests for every component of your TRS-80 Model 1, 3, or 4 (separate versions for each model). **ROM:**checksum test. **RAM:**three tests. **Video Display:** character, video RAM, signal. **Keyboard:** every key contact tested. **Line printer:** character tests. **Disk Drives:** disk controller, drive select, track seek, read sectors, formatting, read/write/verify data with or without erasing, disk drive timer, disk head cleaner. Single/double density, single sided or double sided drives from 1 to 99 tracks. **RS-232-C Interface:** connector fault, data transmission, framing, data loop, baud rate generator. - Specify version when ordering.

SMART TERMINAL $ 19.95

The intelligent telecommunications program for TRS-80 Model 1, 3, 4 or 2/12 CP/M. Memory buffer for sending and receiving file. Automatic transmission and reception of data. Character translations, true **BREAK** key, and help screens.

HOWE SOFTWARE FOR TRS-80 AND MS-DOS SYSTEMS

SMALL BUSINESS ACCOUNTING WITH PAYROLL $ 99.95

Based on the Dome Bookkeeping Record #612, this program handles bookkeeping and payroll for a small business. Bookkeeper provides single entry ledgers for income and expenses, computes monthly and yearly summaries. Payroll handles up to 99 employees, with automatic deductions of F.I.C.A. and Federal income tax. State tax and three optional deductions also included. Prints payroll and expense checks, Form 941 reports and W-2 Forms.

MAILING LIST $ 79.95

Create and maintain mailing lists of up to 32,767 names and addresses. Up to five-line entries, including title, first and last names, optional second line, address, city, state, zip code, optional fifth line and telephone number. Sort or search for names by any field. Prints labels in 1, 2, 3, or 4 adjustable columns or on envelopes. Print form letters with any substitutions.

HOME BUDGET and CHECKBOOK ANALYST $ 49.95

A complete checkbook program combined with budget comparisons, income and expense analysis, and projections. Computes current checking balance. Also handles non-check expenses, bank debits, and income. Monthly and year-to-date summaries, yearly projections based on data up to a known month.

SMALL BUSINESS MANAGEMENT SYSTEM $ 149.95

A complete **point-of-sale** program for a small business. **Order desk** handles order entry, invoicing. Includes 1,999 8 character part numbers. **Bookkeeper** maintains general ledger. **Inventory** produces sales reports. **Installation** sets program to your business.

ADD SHIPPING AND HANDLING TO ABOVE PRICES

IDIM BULLETIN BOARD HOST SYSTEM by Leonard Lorden

IDIM (I did it my way) Bulletin Board Host System is a completely new software system written for the Model 4. It comes with a 22 page manual full of instructions on how to get started and three disks of programs for setting up your own bulletin board system, or upgrading your existing system. Many new operating features have been added to this bulletin board program by the author. For those who would like to review its features send $2 to cover the cost of mailing and we will send you a copy of the manual for your inspection.

$ 80, plus S&H.

I/O-BUS CLOCK

External Clock

$59.00
Plus S&H

Automatically install current date and time on boot up.

No soldering, no wiring, you do not have to open your computer.

Just plug the I/O-BUS CLOCK unit on the 50 pin I/O bus connector of the Model 4/4P/4D. Compatible with using a hard drive by using a 50 pin Y cable.

Unit is shipped with program for either Model 4 TRS/LS-DOS or Model 3 DOS LSDOS 5.x.x or TRSDOS 1.3.

Please specify Model 4 or Model 3 when ordering.

Disk Operating Systems

TRSDOS 1.3 disk only no manual	$ 7.00
LS-DOS 6.3.1 Upgrade disk with mini manual.	$ 39.95
LDOS 5.3.1 Upgrade disk with mini manual.	$ 39.95

Operating System and Manual.

TRSDOS 6.2.1 New original TRSDOS manuals and system disks.	$ 45.00

TRS-DOS 6.x Manuals Only

Model 4 Disk Owners Manual	$ 20.00

(Used copies no operating system disks)

Plus S&H

ROM CLOCK

Internal Clock

$ 35.95
Plus S&H

ROMCLOCK Clock Chip
AND ROMCLOCK4 or 3 PROGRAM
from Computer News 80

The clock chip will install in any Model 4 or 3 computer. It provides keeping time for year, month, date, hour, minute, and seconds. Plug it in and never have to type the time and date again. It has a lithium power cell that lasts over 10 years. Complete with installation instructions and support.

ROMCLOCK4 OR ROMCLOCK3
UTILITY PROGRAM PACKAGE
by David Goben

The new clock operating program that works on SmartWatch, No-slot Clock and the CN80 ROMCLOCK. Simpler to operate and takes less memory than previous SmartWatch programs.

Complete program and manual.
$ 5.00 each add S&H

MINE FIELD

EXCITING AND NEW GAME FOR THE TRS-80 MODEL 4.

by Richard VanHouten

Cross the mine field and flag all the mines in advance of your troops without going boom yourself.

Five degrees of difficulty, the more mines you flag the higher your score.

Fully serial mouse supported, but a mouse is not required.

$ 12 plus S&H

Programs by David Goben

Available *only* from *Computer News 80*

David's Model 4 File Utilities: **for TRSDOS/LS-DOS 6.x.** Nine great file handling utilities to ensure the reliability of your files and save you *hours* of work. Of them: **DSPTXT** will allow you to view ASCII files in forward and reverse, featuring automatic word wrap, tab expansion, printed form setup, and embedded graphics. **INDEX4** will list a disk's visible files in alphabetical order, and allows you to add comments to describe them. **ERASE** totally removes all traces of a file from a disk -- ensure data security. **UNREMOVE** will recover removed, killed, and purged files. Will also list all the removed files on a disk. **SAVBAS** allows you to recover a BASIC program stored in memory after you leave BASIC (and forgot to save it). *Many other utilities.* **$9 + S&H.**

David's Model III LDOS File Utilities: **for LDOS 5.x.** Has the same programs as those described above, except for **SAVBAS** (not needed). Contains 8 programs. **$9 + S&H.**

David's Model 4 System Utilities: **for TRSDOS/LS-DOS 6.x.** 16 powerful programs to streamline your system maintenance. Featured: **XMEMDISK** is the most powerful MemDISK utility going. Maintain more than one MemDISK! **XDRIVE** will allow you to make one disk drive act like 2. **ONEPASS** is the most powerful single-pass disk duplicator ever. Even more powerful than QFB and DISKCOPY. **VERDISK** will verify the integrity of your disks. **PRINT** allows you control any printer from the DOS command prompt. *Plus many other useful utilities.* **$16 + S&H.**

David's Model III LDOS System Utilities: **for LDOS 5.x.** 14 powerful programs to streamline your system maintenance. Includes all programs described above, less **XMEMDISK**. Includes **VIDX** to greatly enhance your screen and character control. **$16 + S&H.**

T62DOSXT: **For TRSDOS 6.2.x.** Still use TRSDOS 6.2 but want to re-enable the dating? T62DOSXT will patch your system to take TRSDOS 6.2 through the end of 1999. Something that LSI, the DOS's creator said was impossible. ***FULL*** compatibility with the date format of LS-DOS 6.3. Includes numerous optional system enhancement patches. Also features **DATECONV** to upgrade disks to the new format. **ONEPASS** for disk duplication. Plus more! Unlike other patches, this package is *safe* with older disks that have not been converted. Use **T62DOSXT** with *complete* confidence. **$18 + S&H.**

PACK: **For TRS-80 or MS-DOS.** Pack, unpack, compress, or superpack your BASIC programs for faster operation and more efficient use of disk space. The TRS version contains both Model I/III and 4 versions. MS-DOS version requires DOS version 2 or higher. Please specify computer system when ordering. **$17.95 + S&H.**

DEA: *The Disk Editor/Assembler.* The *most* powerful integrated editor/assembler ever written. Contains both Model I/III and 4 versions. Has more enhanced features than any other. Conditional assembly, long label names, and abundant powerful math functions that are lacking in other packages. Reference addresses in, or include code from other disk files while assembling programs. These are only a small part of its many powerful features. The **DEA** package also includes a disassembler, cross reference utilities, and plentiful programming examples. **DEA** was used to write ***EVERY*** program listed in *Computer News 80* by David Goben, including **BCX, MagicDraw, Symphony 90, Diskopt, SCRIPT,** and *all* the others!

DEA: *Making Assembly Language Accessible.* **$49.95 + S&H.**

High Resolution Programs by David Goben

Available *only* from *Computer News 80*

MagicDraw: *Making screen design easy.* **For Model 4/4p/4d with a hi-res board and a serial mouse with mouse driver software.** No high resolution Computer-Aided Drawing program has ever been like it. Nothing comes close to the speed, ease of use, and the power offered by **MagicDraw**. ***NONE!*** If you thought drawing on the hi-res screen was too cumbersome or too difficult and that you would have to leave that kind of work to others with more experience, then *think again*. **MagicDraw** is as close to buying hi-res experience as you can get.

MagicDraw offers you *dozens* of features more than its nearest competitor. It also offers you a menu selection system that was said to be totally out of reach of a TRS-80. *Wrong!* Choosing the right tool for the job has never been so easy. No more going to help screens or digging through manuals to remember a tool's selection command; with **MagicDraw** you can do so right from an easy-to-use menu.

MagicDraw: *Realizing dreams.* **$65 + S&H.**

Hi-Res Utilities Package: **for Model 4/4p/4d with a hi-res board.** Take control of your hi-res artwork with this group of 10 utilities. These are the fastest hi-res utilities ever written. **HRLOAD** will load a high resolution screen file in a fraction of the time of its nearest competitor. It will load the normal **HR** files, the "crunched" **CHR** files, and super crunched **SHR** files. **HRSAVE** allows you to save hi-res screen in **HR**, **CHR**, and **SHR** format. **HRFXPRT** allows you to dump the hi-res screen to an Epson-compatible printer with an *incredible* variety of resolutions. **HRIBMPRT** dumps to an IBM ProPrinter-compatible printer. **HRLSRPRT** dumps to a LaserJet+ compatible printer or DeskJet printer. Seven sample files included. Other utilities allow you to clear, flip, view and shrink the screen. Take the difficulty out of processing your hi-res screens. **$15 + S&H.**

Postmaster Support Utilities: **For Model 4/4p/4d with a hi-res board and with *POSTMASTER*.** Enhance your work with David P. Miller's fantastic ***POSTMASTER*** program with this set of utilities. **MAKEICN** allows you to *capture* a portion of the screen and convert it into a ***POSTMASTER*** icon. 3 capture box sizes allows you to capture larger portions of the screen and shrink them down to icon size, if you wish to. **ADDICN** allows you to add a captured icon to a library file, which ***POSTMASTER*** can use to choose from several icons. **DSPICN** allows you to view the icons you captured. **DSPLIB** displays your ***POSTMASTER*** icon libraries. **DECDFON** and **DECDBOR** allows you to *decode* ***POSTMASTER*** font and border files so that you can edit and customize them using any text editor or word processor that can process ASCII files, such as **SCRIPT** or **EDIT-4** (both available from CN80). **ENCDFON** and **ENCDBOR** allows you to *encode* ASCII files of your own creation, or *back* into font and border files to make them usable by ***POSTMASTER***. **ADDFON** and **ADDBOR** allow you to combine font and border files into libraries for use by ***POSTMASTER***. Other utilities included, along with sample files. **$39 + S&H.**

POSTMASTER 24: **for Model 4/4p/4d with a hi-res board and with *POSTMASTER*.** This filtering program allows you to print your ***POSTMASTER*** printouts on a 24-pin Epson-compatible printer (such as CN80's Seikosha SL-90) with super sharp ***laser quality***. Works transparently to the rest of the system, loading right along with ***POSTMASTER***, and even removing itself when you are done with ***PM***. This is a utility that has to been seen to be believed! **$15+ S&H.**

FAST System Utilities

By **David Goben**, & *only* from *Computer News 80*

Fbackup: The ***fastest*** file-by-file backup utility ever written for the Model III or Model 4/4p/4d. Designed for LDOS 5.3, TRSDOS 6.2, or LS-DOS 6.3 It's a whopping **8 TIMES FASTER** than the BACKUP/CMD program supplied with these Disk Operating Systems. Plus it has many new features: *alphabetized backups, single drive file-by-file backups, and more*. It will even tell you how many disks you will need. This program has to be seen to be believed. Specify Model III LDOS 5.3 or Model 4 TRSDOS 6.2/LS-DOS 6.3 on order. $15 + S&H.

Fastback: The ***fastest*** hard disk backup utility ever written for the Model III or Model 4/4p/4d. No other hard disk backup or archiving utility is faster. ***NONE!*** Don't be fool by another's claims. Selectively backup or restore files, alphabetize, even see how many disks a backup will require. As easy as **FBACKUP**, but made for those large files that normal backup disks would not be able to hold. Designed for LDOS 5.3, TRSDOS 6.2, and LS-DOS 6.3. Specify Model III or Model 4 on order. $29.95 + S&H.

Fformat: This is the ***fastest*** disk formatting program ever written. Formats a 180K disk in 18 seconds! Works like FORMAT, but with greater versatility and speed. It can even apply high level formats and verify hard disks in one step -- no more fumbling with more than one utility. A PURGE parameter allows you to reformat disks in a flash. Format 80-cylinder 2-sided disk with ease with the BIG parameter. Designed exclusively for LDOS 5.3, TRSDOS 6.2, and LS-DOS 6.3. Specify Model III or Model 4 on order. $15 + S&H.

Word Processing

by **David Goben**, & *only* from *Computer News 80*

Script: Word processor for the Model III and 4/4p/4d. ***Not*** a patch program. This is a *complete* word processor with all the features made famous by SCRIPSIT, *plus* dozens of new amenities. Powerful editing, formatting, and printing features you would expect only from packages costing much, much more. A poor person's word processor that produces professional results. Specify computer and DOS when ordering. $37.95 + S&H.

Script Spelling Verifier: For Model III and 4/4p/4d. A *powerful* spelling checker/corrector for **SCRIPT**, Disk SCRIPSIT, ALLWRITE, ASCII, TED, and other ASCII format files. Features over 75,000 words. Add up to 17,000 more words to an additional custom dictionary. Specify computer and DOS when ordering. $37.95 + S&H.

SuperScripsit Spelling Checker: For Model III and Model 4/4p/4d. Add spell checking / proofreading capabilities to SuperSCRIPSIT. Fully integrates into the word processor. *Easy* to install. Specify computer when ordering. $37.95 + S&H.

Model 4 Spreadsheets

Written by **David Goben**

Available *only* from *Computer News 80*

BCX: *The Business Calculator for Extended Memory Model 4's.*

The spreadsheet for the 90's. For Model 4 128K+. Called by its users the *friendliest* and *fastest* spreadsheet ever written for the Model 4. **No** Model 4 spreadsheet calculates faster than **BCX**. It is so fast that users have become used to keeping the automatic update feature on at all times; something you would *never* want to do with VisiCalc or Multiplan. **BCX** can calculate sales projections, income taxes, personal budgets, cost estimates, engineering changes, balance your checkbook, plus ***thousands*** of other applications. Whatever you need tabulated or computed, **BCX** can do! Play "what if" with your spreadsheets to figure your best strategies; **BCX** will remember your calculations so that when you make changes that will affect other cells, the entire spreadsheet can be *quickly* and *automatically* updated to reflect those changes, no matter how many or how drastic.

Among its numerous features are:

- **Support of up to *1 megabyte* of memory**
- **A huge 64 x 256 cell matrix (16,384) to accommodate any needs**
- **Powerful, complete set of trigonometry functions for engineers**
- **Powerful automatic table look-ups**
- **Range math that transcend simple column or row limits**
- **Read and use VisiCalc sheets with little or no change**
- **Read and use Busy-Calc sheets without changes**
- **On-line, detailed quick reference windows to jog your memory**
- **Pop-up command windows in *plain* English; no trick keywords**
- **Fastest screen scrolling of any spreadsheet**
- **Powerful printer options to set up any printer**
- **Huge hand-holding hands-on tutorial to help you master BCX**
- **Many powerful replication and data manipulation features**
- **A handy quick reference and a complete reference manual**

and *many more* capabilities. Has all the features users wished VisiCalc and Multiplan had. With all this power, why settle for anything less?

BCX: *The way spreadsheets should be.* $109 + S&H

Demo disk available for $15. Good toward purchase of full program.

Busy-Calc: *The Family & Small Business Spreadsheet.*

For Model 4 64K+. An economical, yet powerful and *extremely fast* spreadsheet for those who do not need huge layouts. A comfortable 64 x 64 cell matrix with powerful function, math, and reference support. Can support up to 4 banks of extended memory if you have it, though not necessary. Has most of the features of **BCX**, though simpler in structure and thus easier to use.

Busy-Calc comes complete with a reference manual featuring an extensive hand-holding, hands-on tutorial. A quick reference manual is included when you just need a refresher.

Busy-Calc: *Making spreadsheets easy.* $79.95 + S&H

Demo disk available for $10. Good toward purchase of full program.

The CN80 MOUSE HOUSE

MOUSE DRIVER

by David Goben

Complete Mouse Driver Program
and printed manual for 2 or 3 button mice
for use with your Model 4
Write your own mouse programs in Basic
or other program languages.
$10 plus $3 Shipping & Handling
Published and Distributed by

Computer News 80

M T K

by David Goben

Complete Mouse to Keyboard Interface
and printed manual for 2 or 3 button mice.
Model 4 - Mouse Driver Required to use.
Take over your keyboard, arrow keys
with MTK, makes playing games easy.
$18 plus $3 Shipping & Handling
Published and Distributed by

Computer News 80

CN80
Three Button Mouse

and adapter for RS-232 connection.
$ 26.95 plus $ 4.00 S&H

....

Extender Cable for Model 4 with
the RS-232 connector out the bottom.
$ 8.00 plus $ 2.00 S&H

....

Use an AB switch to connect both Mouse and Modem

CN80 COMBINATION MOUSE PACKAGE

Includes Three Button Mouse
Adapter for Model 4 connection
(4s with connector out the bottom require an additional cable)
The Mouse Driver Program
The MTK Mouse to Keyboard Program

For Model 4 with RS-232 out the back	$52.95
For Model 4 with RS-232 out the bottom	$59.95

Plus $ 4 Shipping and Handling

Computer News 80 120ns and 150ns Chips

64 K UPGRADE KITS FOR MODEL 4 $12.95

Our Kit consists of eight 64k 150ns 128 refresh cycle
dynamic ram chips, plus instructions and Memory Test Disk.
$4.00 S/H in the US. $6.00 APO,FPO. $ 8.00 AK,HI and Canada.

»»»»»»»»»»»»»»»»»»»»»»»»»»»»»»»»»»»»»»

64K 120ns 128 refresh cycl. chips $ 2.75 ea.

16 Chips are required for use with Anitek Speed Up Kits.
$4.00 S/H in the US. $6.00 APO,FPO. $8.00 AK,HI and Canada

PAL CHIP - needed to upgrade Non-Gate Array Model 4s
$ 8.00 each shipping and handling included.

DISKOPT UTILITY PACKAGE

A disk optimizer and file defragmenter for hard drives and floppy disk drives.

by David Goben

Completely defragment files on a hard drive or on floppy disks.

The more you write to file on a hard disk or floppy disk, the more scattered the data becomes on that disk. Sooner or later the data for one or more files becomes so scattered that the drive may not be able to read them. To protect against this possibility you should use a disk optimizer utility on a regular basis.

$29.95

I/O-BUS LD INTERFACE

for EXTERNAL FLOPPY DISK DRIVES

Add external floppy disk drives to your Model 4P - no internal wiring - plug the interface into the external 50 pin I/O connector on your 4P and plug your external disk drives into it.

Add additional floppy disk drives to your Model 4 or 4D - again just plug the interface into the 50 pin I/O bus connector and add floppy disk drive 4 & 5.

Software for TRSDOS 6.2.x and LS-DOS 6.3.x and cable included.

Controls Double-Sided 5.25 360K, 3.5 720K or Single-Sided 180K drives.

$ 180 + $4 S&H

= =

Software for LDOS 5.3.x $ 29.94 + S&H additional. For use with the Model 4 in the III mode.

Classified *Computer News 80* Classified

MODEL 3+4 public domain programs, free disk catalog, JaRick Software, 4201 71st Ave N., Brooklyn Center, MN 55429. Over 2000 to choose from Drop us a line.

SELLING LMP 2150, 16 in, Draft 150 Lines/min, Corr. 80 L/m. 10, 12.5, 16.7 CPI. ASCII, Amer Spec, Euro WP & Block Graphics. 8-bit Parallel. Manual & ribbons. $1,000. M3, 32k, tape, $20. M3, 32k, 2 PERCOM drives, NO controller, $30. LP IV w/manual & extra ribbon, $50. LP VI 16 in, $60. Replaced drives, 2 SSDD FH $15 ea. 4 SSDD 1/2H $20 ea. Plus UPS. Call Bill (513)233-8913 or Write 9250 Adams Rd, Dayton, OH 45424

FOR SALE: Large selection of TRS-80 software, books & manuals. Please send 10" SASE for listing & prices to: Alfred F. Peruzzi, 48 S. Longview Rd, Howell, NJ 07731

FOR SALE: GENUINE RADIO SHACK HARD DRIVES for Models 3 & 4. 5 Meg $175. 10 Meg $225. 15 Meg $275. 20 Meg $325. 35 Meg $455. Formatted under LS-DOS 6.X. New MISOSYS RSHARD5/6 driver included. Do it yourself special, (No Bubble) $125. Includes controller, P/S, fan, cables, driver. Install your own ST-506 bubble, half or full height. Instructions included. All cables included. Add S&H to all prices. All hardware used, tested, warranted 90 days. Call: Roy T. Beck 213-664-5059 after 6pm California Time, or Write: 2153 Cedarhurst Dr, Los Angeles, CA 90027

FOR SALE: Tandy DWP-230 daisywheel printers w/separate tractor feed. I have (3) such printers, complete. Sell at only $150 each. Use Diablo 630 ribbons & printwheels. Write: G. Kleiser, Box 34, Rayne, LA 70578. If you must, call 318-783-1640 leave message.

USED Color Computer 2 w/16k $30, w/manual, plus $4 S&H. RS 15Meg Hard drives (we only have two) $200 plus $6 S&H. Call or Order from CN80.

NEW & USED ORIGINAL DISK DRIVES: New Single-sided 180K full height $50 + $4 S&H. USED ss/dd, 180k $25; ds/dd 320k $35; plus $4 S&H. Replacement Keyboards, CRT Screens & Misc parts. Call: CN80 (307)265-6483 for availability & prices.

CLASSIFIED AD RATES
$1.00 per line. A line is 35 characters or spaces wide. Minimum ad charge $6.00

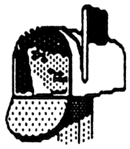
MODEL I SERVICE AND REPAIR
Art McAninch - (806) 273-6378
122 Pecan - Borger TX 79007

The File Cabinet

THOUSANDS OF PROGRAMS

Programs as low as 15 cents each.
Order your printed catalogs today !

MODEL 4 CATALOG	$2.00
MODEL 1/3 CATALOG	$2.00
Hundreds of Utility, Business, Game, Educational and Communication Programs are in each catalog.	
HIGH RESOLUTION CATALOG	$2.00
Hundreds of /HR format pictures, including nudes and other artworks. Ready to use alone or create PostMaster Icons or Clip Art.	
MAC/PAINT CATALOG	$2.00
Hundreds of files created with MacPaint. View on the Model 4 or print using Mac Utilities.	
SYMPHONY 90 CATALOG	$3.00
Hundreds of music files ready to play.	
PostMaster ICON CATALOG	Free
ALLWRITE FONTS CATALOG	Free



Disk Volume Prices: 1 to 10 Volumes $3.50 ea. (X) S&H, 11 to 20 Volumes $ 3.25 ea. (Y) S&H, 21 and over $3.00 ea. (Z) S&H. 5-1/4" or 3-1/2" disks. No extra charge for 3-1/2" disks.

Download Through The Mail

PLATINUM

3-1/2 DISKS
Double Sided Double Density

Premium Quality
by Major US Manufacturer
69 Cents Each
Complete with labels and sleeves
100% Certified Error Free, Lifetime Warranty

Only one computer diskette is platinum perfect, only one gives your computer the confidence to store all your critical data.
PLATINUM SERIES computer diskettes are certified 100% error-free; all the bits are ready to work for you.
For the best in data protection, award your computer PLATINUM SERIES diskettes.

From the World of **syncom**

ABSOLUTELY THE BEST
BOXED BRAND NAME DISKS
10 Mil. Jackets 5-1/4 Double-Sided or Single Sided

$ 7.40 per box of 10

From the World of **syncom**™

5-1/4 Floppy Disks

Double/Single Sided
Double Density 10 Mil Heavy Jacket
Premium Quality Made In USA
100% Guaranteed Error Free
$9.75 for 25

Copyright (c) 1993
Construction News Publishing Co.

Computer News 80 Published monthly at a subscription rate of $24 for 12 months mailed bulk in the United States. Mailed first class in the US $36. Canada and Mexico $35.50 US funds. Overseas $42 US funds, surface mail. Write for overseas air mail rates.

Stan Slater, Publisher
Ron Gatlin, Associate Publisher

Classified ad rates $1.00 per line of 35 characters or spaces, per issue. Minimum $6 per issue.

6/3

Computer News 80
P O Box 680
Casper Wyoming 82602-0680

BULK RATE
U S POSTAGE
PAID
CASPER, WY 82601
PERMIT NO 309

FORWARDING & RETURN POSTAGE GUARANTEED
ADDRESS CORRECTION REQUESTED